DOMESTIC ENGINEERING

Whole No. 978. Vol. LVI. No. 11. 443 South Dearborn St., Chicago. September 9, 1911

How Can I Sell?

Everything in the world is for sale or exchange. Barter is the keynote of universal perpetuation. Mountains exchange place with valleys; oceans with continents; animals thrive on vegetable death; vegetation flourishes through animal decay, atoms barter with atoms, and molecules with molecules, to effect new combinations to be appropriated by man. Barter is universal.

Barter is salesmanship. The heart of salesmanship is affinity. The goods must possess charm to their prospective purchaser. They must serve their purpose—their dual purpose—the purpose for which they were made and the purpose for which they are intended by the purchaser. It is the art of the salesman to make clear the dual function and use.

Everybody in the world is a salesman, and salesmen are divided into good, bad and indifferent. They are graded in the world's price-list from a $1.50 a day to $150,000 a year. Some salesmen sell labor, and mighty poor labor at that. Others sell brains at bargain prices. The differences in salesmanship are due to relative inability to set forth attractively the advantages of the thing to be sold.

Since selling is such an important thing, it is not to be wondered that the question which heads this article is often put by all of us from time to time—How can I sell? It can be answered without much hesitation. We can only sell according to our basic knowledge and faith in the worth of the goods we have to offer. We are not taking into account the fake sales made by the knowledge of the gullibility and ignorance of the purchaser. The principle in all cases, however, is the same. The sharper, the promoter, the goldbrick artist, the confidence-man, the furniture-selling widow, make their sales entirely upon their **knowledge** that there are suckers born every minute, and that these suckers are biters from their birth to their death. "Once a sucker, always a sucker." Fortunately for the world, men and women do not take kindly to swindling salesmanship. There is inherent in man a supreme love of the square deal. He may fall short of it, but he worships it, nevertheless, even though it be from afar off. In every man's heart of barter, he erects an altar to the unknown god, heralded in the gospel of the Square Deal.

Essential in selling is the possession of common-sense. It is badly named. It should be uncommon sense. Common-sense never sold anything, it was always a buyer, but we have to defer to customary terms, with this side-note on definition. **In salesmanship, energy is necessary.** One may have common-sense but not have sufficient force to make it operative. Energy without common-sense is often misdirected. It runs amuck, and is destructive instead of constructive. **Coupled with common-sense and energy, and above them both, the salesman must possess honesty.** Not the honesty of the letter but the honesty of the spirit. He must exhale it when he gets up in the morning. He should exude it in his dealings throughout the day. Its atmosphere should surround him when he goes to sleep. He should live it. Probably in all salesmanship lack of honesty is the cause of most failures. It is easy to be smart for a minute, but it is too strenuous a game to keep up and it does not hold the trade it gains.

People who read articles on salesmanship generally expect to read an avalanche of sharp tricks, by the use of which they can get something for nothing, a la "Get-Rich-Quick-Wallingford." You won't find that in this article. **There is no way to sell at a profit except through hard work. Any form of salesmanship which does not have these three essentials for its base is a bunco-game.** It is theft. It is stealing. It is lying. There are no other names to be given to it.

When these three essentials are recognized, selling for profit can be considered but is not assured. **One can possess common-sense, energy and honesty, and still be left at the starting-post as a salesman.** Many men who are earning $1.50 a day have common-sense, energy and honesty, but they will never earn any more than $1.50 a day.

To sell goods—and that means to sell with profit,

for selling without profit is giving them away—**one must be thoroughly posted on the merits of the goods themselves**; the uses to which they are put; the conditions they will meet in service; the defects which they may manifest under usage; their relative values to other goods on the market; the same knowledge above-cited concerning all the other goods on the market; the peculiarities of the purchaser and of the localities in which the goods are to be used. That means hard work. **It means study. It keeps the brain working when the shop-door is shut.** It allows no time for loafing over the bar-room counter.

When posted, it is not necessary for a man to pour out all his knowledge on an innocent customer. The customer has no desire to know it all. All he wants to know is **what he wants to know.** It is for you to give him fullest service in that regard, but no more. This is where common-sense comes into play, and energy takes a back seat. Many customers are talked to death by over-energetic salesmen. A quiet presentation of the knowledge needed is more effective in influencing a customer than a Labor-Day procession of unrelated facts.

To sell, one must have a certain degree of firmness. The customer must be made to feel that the goods are as represented; that they are worth every cent of the price quoted; that the salesman represents a house whose every employee is vitally interested in handling and installing the goods so that he (the customer) will receive them in the best possible working condition. The salesman must believe that, or he cannot sell with profit. He must be conscious of his ability to call upon the reserve forces of his establishment, whether it be large or small, to deliver the order, and to stand behind the goods.

The plumber or steam-fitter can only sell at a profit in the measure that he knows that the institution he controls can back him up in his selling. If he has a foreman who is uncivil, careless, and a "rough-houser" on the job, he is not selling all he should to the customer, and his profit will be correspondingly less.

If he has workmen who are discontented; who are of the floating type; who loaf on the job; who neglect their tools; who think habitually: "Well, I guess that's good enough;" he is not selling all he should to the customer, and his profit will be correspondingly less.

If he has helpers in the shop who do not love their job; who do not respect the men they help; who do not believe that he is the best boss going; who have not a reverential loyalty to the establishment which employs them; he is not selling all that he should to the customer, and his profit will be correspondingly less.

And these things are things that can be had. They are not dreams. One does not have to become a magician to get them, or a juggler, or a trapeze-artist. There are good boys and good men to be secured, who will barter their best services for the best wages; who are always salesmen of the highest type on their particular plane. A man who is running a plumbing or a steam-fitting shop, or both, that cannot leave his shop in the morning and know that every atom of the establishment is plugging for him in his absence, from the common materials to the foreman, is not going to be capable of selling to the best advantage. Even the goods on the shelves, properly sorted and carefully kept, have a voice in running the business. The clean floor, the polished windows, the spotless bath-tub, the attractive fixture-display, the shining combinations, the neat office-desk, the nifty calendar on the wall—all these plug for the boss when he is out, and help him in his salesmanship.

One could write a book on the things that make for selling, but we are only dealing with the essentials. A few other important helps in selling may be mentioned. **One of the most important of these is that the best selling is done without knocking one's competitors.** Of all the fool tricks that are used in the selling-game, this is the one that is of the worst taste and has the most unlooked-for results. Start out with the idea that your competitor is a good fellow. Give him credit for his possibilities, and in selling never mention him except with respect. You may have to stretch a point at that sometimes, but it will do you more good to do the stretching on the right side.

Don't argue with a customer. Presumably, he didn't come into your store to argue; he came to buy. If he didn't come to buy, the sooner you get rid of him in a nice way, the better. Let him leave anyway with an impression of your courtesy and good-feeling. He will buy some other day. **Argument is never an asset to salesmanship.** Above all, never promise any more than you can perform. The best salesmanship is that which sells goods without over-estimating their worth to the customer, at the proper price, and with the knowledge that when installed they will more than fulfill any promise made. You must be able to back and look at the job. There is too much selling that never contemplates a return visit. **Lastly, all the selling must have behind it the spirit of service.** You must make your customer's interests your own; you must sell to yourself as well as to him; you must be satisfied when the deal is closed that you would be satisfied if you were in his place. All selling to be a success must be of that kind. **It must bring satisfaction to the customer and payment for the goods in advance, with a profit in the payment.**

QUESTIONS AND ANSWERS

LACKS CHECK VALVE ON PNEUMATIC SYSTEM.

Editor "Domestic Engineering":—Will you be kind enough to tell me what is the matter with the water-works system in my house? It does not seem to hold the pressure very well and, after one has pumped a while, it is almost impossible to pump any more and the handle of the pump flies up with great force.

Delavan. S. G.

If the pressure runs down quite rapidly, we should say that you had a small leak somewhere on the job. The difficulty you mention with regard to the pump leads us to believe that you have no check valve on the job between the tank and the pump. We believe that if you put one on, you will find that the pump will work much easier and then you may find that the system will hold the pressure all right.

CONNECTING TUB OR LAVATORY WASTE INTO CLOSET-DRAIN.

Editor "Domestic Engineering":—Would you consider it good practice to connect either (or both) the lavatory or bath-waste into the pipe drain from the water-closet? I have observed that it has been done to a large extent in some places and would like to ask your opinion.

Burlington. M. M.

We are aware that such practice has obtained in different parts of the country, but it is not the best. If the contractor will study the lay-out, he can secure a separate entrance for each fixture into the stack. If this cannot be done by means of the ordinary fittings, there are now plenty of special fittings on the market. If each fixture is run into the stack independently, when one fixture gets out of order it will not put any of the others out of business for the time being, as is frequently the case when two or more drains are combined.

TOOLS FOR CALKING.

Editor "Domestic Engineering":—Will you tell me the names and how many tools go to make up a set of calking-tools?

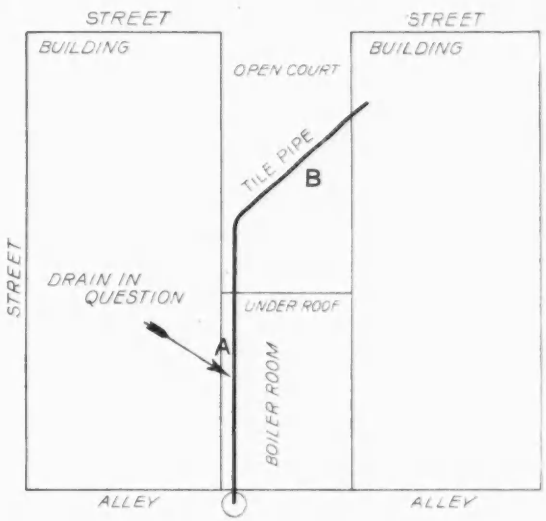
Aurora. R. C. J.

To make out a complete list would not be practical, as every plumber seems to have different ideas in regard to this matter and the tools that would suit one plumber would not always look good to another, but we will name some.

You will need first a good cold chisel. Secure one that is rather on the blunt order, for it will give better satisfaction than one that is thin and constantly breaking at the edge. You will need at least two yarning tools, one long and the other shorter. The longer iron should have some spring to it, and the short one be quite stiff. Besides these, you will need five or six tools for calking in the lead. These will be bent at different angles and some will have a right offset, while others will have a left offset. Then several very short calking tools for tight places and on the ells. After a while you will, most probably, invent five or six tools according to your own notion. That is the way that it works out with most plumbers and we presume that you will prove no exception to the general rule.

WHICH SHOULD IT BE, IRON-PIPE OR TILE?

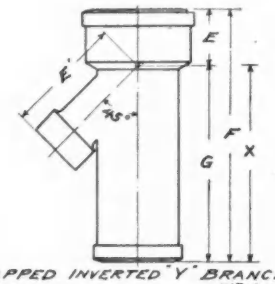
Editor "Domestic Engineering":—I am taking the liberty to ask you a question. We are sorry to say that we have two different inspectors for the plumbing and the sewer work. Between the two, this question arose, illustrated by the sketch I send. The plumbing inspector contends that the part of the drain marked "A" is a house-drain and should be of iron pipe, that is, soil-pipe. The sewer-inspector claims that it is a sewer and does not



require cast-iron pipe. Is the drain in question a house-drain or a house-sewer? Our code calls for all drain-pipes inside of the building to be of cast-iron or lead. The drain in question is three feet under cement floor. An early reply would save a lengthy argument.

Wichita. Plumbing Boss.

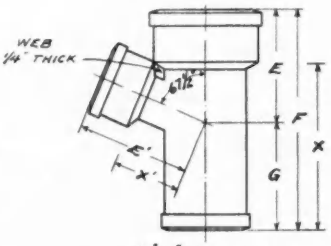
There should be no argument about it. Your code calls for all drain-pipes inside to be of cast-iron and lead. The pipe-section "A" is under the boiler-room. How does the sewer-department make out that a boiler-room is not a building? In considering questions of this kind the spirit behind the code must be sought. Iron pipes are chosen in the building-line in reference to tile, because they are not so likely to be broken through settlement of floors or building walls. The boiler-room is just as much a building as the structures adjoining it and if the code is to be followed, the drain must be considered as a house-drain, and cast-iron or lead must be used. In our judgment it would be advantageous to continue the iron pipe through section "B" and until clear of the buildings, for it would avoid clumsy joints. You have, however, not raised this question, and we content ourselves with replying in detail to the question under consideration. We trust this reply may be of some assistance to you.



TAPPED INVERTED "Y" BRANCH

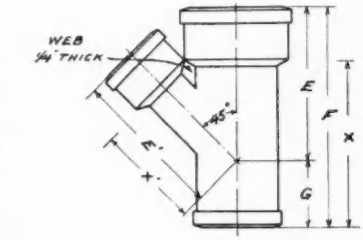
SIZE	E	E'	F	G	X	WEIGHT STD.	WEIGHT X. H.
2"x2"	3½	5	13½	10	11	6¼	10¼
3"x2"	3¼	3¾	13¾	10½	11	8	13¾
4"x2"	3 1/16	6½	14	10 5/16	11	10¼	17½
5"x2"	2⅝	7 3/16	14	11⅛	11	12	21
6"x2"	2⅜	7⅞	14	11 9/16	11	13¾	24

TAPPING BOSS ON FITTINGS MAY BE TAPPED FOR 1¼" TO 2" PIPE THREADS INCLUSIVE.



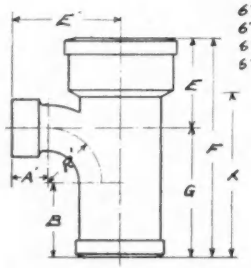
½ "Y" BRANCH

SIZE	E	E'	F	G	X	X'	WEIGHT STD.	WEIGHT X. H.
2"	5¼	5¼	11½	6¼	9	2¾	5½	10¼
3"	6¼	6¼	12¾	6½	10	3½	8½	15½
4"	7¼	7¼	14	6¾	11	4¼	12	21½
5"	8	8	15	7	12	5	15	27½
6"	8¾	8¾	16	7¼	13	5¾	18½	34
3"x2"	5⅞	5¾	11¾	6½	9	3¼	7¼	13½
4"x2"	6⅛	6¼	12	5⅞	9	3¾	9¼	16½
4"x3"	6⅝	6¾	13	6⅜	10	4	10½	19
5"x2"	6⅜	6⅞	12	5⅞	9	4⅜	10¾	19½
5"x3"	6⅞	7¼	13	6⅛	10	4½	12¼	22
5"x4"	7⅞	7¾	14	6⅝	11	4¾	13¾	25
6"x2"	6½	7⅜	12	5½	9	4⅞	12¼	22½
6"x3"	7⅛	7⅞	13	5⅞	10	5⅛	13¾	25½
6"x4"	7⅞	8¼	14	6⅝	11	5¼	15½	28½
6"x5"	8⅛	8½	15	6⅞	12	5½	17	31



"Y" BRANCH

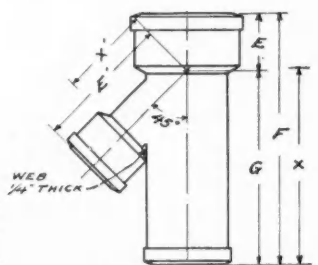
SIZE	E	E'	F	G	X	X'	WEIGHT STD.	WEIGHT X. H.
2"	6¼	6¾	11½	4¾	9	4¼	5¾	11
3"	8¼	8 1/16	13¼	5	10½	5½	9¼	17
4"	9¾	9¾	15	5¼	12	6⅛	13	24
5"	11	11	16½	5½	13½	8	17	31½
6"	12¼	12¼	18	5¾	15	9¼	21½	39½
3"x2"	7 3/16	7½	11¾	4 1/16	9	5	7½	14
4"x2"	8 5/16	8¼	12	3 1/16	9	5¾	9½	17¼
4"x3"	9	9	13½	4½	10½	6¼	11¼	20½
5"x2"	8 1/16	8 1/16	12	3⅜	9	6 1/16	11	20
5"x3"	9½	9 1/16	13½	4	10½	6⅝	13	23½
5"x4"	10¼	10 1/16	15	4⅜	12	7 1/16	15	27½
6"x2"	9 5/16	9 7/16	12	2 1/16	9	7⅛	12½	23
6"x3"	10	10½	13½	3½	10½	7⅝	14¾	27
6"x4"	10¾	11⅛	15	4¼	12	8⅛	17	31
6"x5"	11 1/16	11 1/16	16½	5 1/16	13½	8⅞	19	35



TAPPED SANITARY "T" BRANCH

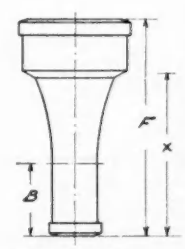
SIZE	A'	B	E	E'	F	G	R'	X	WEIGHT STD.	WEIGHT X. H.
2"x2"	2	4	4½	5	11½	7	3	9	5¾	9¼
3"x2"	2	4	4¾	5½	11¾	7	3	9	7½	12¾
4"x2"	2	4	5	6	12	7	3	9	9½	16
5"x2"	2	4	5	6½	12	7	3	9	11	18¾
6"x2"	2	4	5	7	12	7	3	9	12½	22

TAPPING BOSS ON FITTINGS MAY BE TAPPED FOR 1¼" TO 2" PIPE THREADS INCLUSIVE.



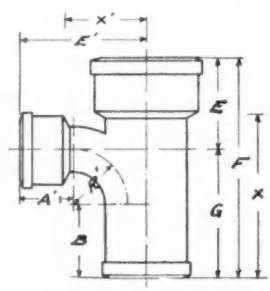
INVERTED "Y" BRANCH

SIZE	E	E'	F	G	X	X'	WEIGHT STD.	WEIGHT X. H.
2"	3½	5⅞	13½	10	11	3⅜	6¼	11½
3"	4	7⅛	15¼	11¼	12½	4⅝	9¼	18
4"	4½	8⅞	17	12½	14	5⅞	13¾	25½
5"	4¾	10⅛	18½	13¾	15½	7⅛	17¾	33
6"	5	11⅞	20	15	17	8⅜	22½	41½
3"x2"	3¼	6⅝	13¾	10½	11	4⅛	8	15
4"x2"	3 1/16	7⅞	14	10 5/16	11	4⅞	10¼	18¾
4"x3"	3¼	8⅛	15½	11¾	12½	5⅞	11¾	22
5"x2"	2⅝	8 1/16	14	11⅛	11	5 9/16	12	22
5"x3"	3 1/16	8 5/16	15½	12 3/16	12½	6 1/16	13¾	25½
5"x4"	4	9 5/16	17	13	14	6¼	15¾	29½
6"x2"	2⅜	8¾	14	11 3/16	11	6¼	13¾	25½
6"x3"	2⅞	9½	15½	12 9/16	12½	6¾	15¾	29½
6"x4"	3 1/16	10¼	17	13 7/16	14	7¼	18	33
6"x5"	4¼	10¾	18½	14¼	15½	7¾	20	37



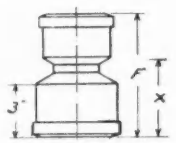
INCREASER

SIZE	B	F	X	WEIGHT STD.	WEIGHT X. H.
2"x3"	4	11¾	9	4¼	8¾
2"x4"	4	12	9	5¾	10½
2"x5"	4	12	9	6¾	12
2"x6"	4	12	9	7½	13½
3"x4"	4	12	9	6½	12
3"x5"	4	12	9	7½	13½
3"x6"	4	12	9	8¼	14¾
4"x6"	4	12	9	9	16¼
5"x6"	4	12	9	9¾	17½



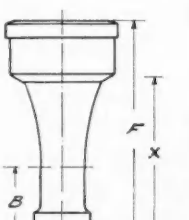
SANITARY "T" BRANCH

SIZE	A'	B	E	E'	F	G	R'	X	X'	WEIGHT STD.	WEIGHT X. H.
2"	3	4	4½	6	11½	7	3	9	3½	5¾	11
3"	3¼	4	5¼	6¾	12¾	7½	3½	10	4	8¾	16¼
4"	3½	4	6	7½	14	8	4	11	4½	12¼	22½
5"	3½	4	6½	8	15	8½	4½	12	5	15½	28
6"	3½	4	7	8½	16	9	5	13	5½	18¾	34½
3"x2"	3	4	4¾	6½	11¾	7	3	9	4	7½	14
4"x2"	3	4	5	7	12	7	3	9	4½	9½	17¼
4"x3"	3¼	4	5½	7¼	13	7½	3½	10	4½	10¾	19¾
5"x2"	3	4	5	7½	12	7	3	9	5	11	20
5"x3"	3¼	4	5½	7¾	13	7½	3½	10	5	12½	23
5"x4"	3½	4	6	8	14	8	4	11	5	14	25½
6"x2"	3	4	5	8	12	7	3	9	5½	12½	23
6"x3"	3¼	4	5½	8¼	13	7½	3½	10	5½	14¼	26
6"x4"	3½	4	6	8½	14	8	4	11	5½	15¾	29
6"x5"	3½	4	6½	8½	15	8½	4½	12	5½	17¼	31½



REDUCER

SIZE	F	X	WEIGHT STD.	WEIGHT X. H.
3"x2"	7½	5	3½	6¼
4"x2"	7½	5	4	7
4"x3"	7¾	5	4¾	8½
5"x2"	7½	5	4½	8
5"x3"	7¾	5	5¼	9¼
5"x4"	8	5	6¼	10¼
6"x2"	7½	5	5	8¾
6"x3"	7¾	5	5¾	10¼
6"x4"	8	5	6¾	11¾
6"x5"	8	5	7¼	12¾



TAPPED INCREASER

SIZE	B	F	X	WEIGHT STD.	WEIGHT X. H.
2"x2"	4	11½	9	6¾	7½
2"x3"	4	11¾	9	5¾	9¼
2"x4"	4	12	9	6¾	11
2"x5"	4	12	9	7½	12½
2"x6"	4	12	9	8½	14

TAPPING BOSS ON FITTINGS MAY BE TAPPED FOR 1¼" TO 2" PIPE THREADS INCLUSIVE.

Table of Dimensions of Proposed Standard Y's, Tees, Increasers and Reducers.

Cast-Iron Soil Pipes and Fittings

By R. R. Rust*

There are used in this country, exclusive of medium, special and patented fittings, over 1,700 different cast-iron soil-pipe fittings. Of this number approximately 75 constitute, in the total number of pieces used, about 85 per cent. In other words, 15 per cent of the quantity of cast-iron soil-pipe fittings used are made up of over 20 times the number of items that is required to produce the other 85 per cent.

Suggestion on Reducing the Number of Fittings.

There is no question that the use of a great many of the occasionally used and unstaple fittings could be very well done away with under present conditions by the application of reducers instead of the very infrequently used reducing fittings, and by the making up of offsets on the less used sizes of pipe by bends and extension pieces. This method would doubtless meet with opposition from the plumber, though the total cost of the work installed would probably be about the same in either case. A great many of the infrequently used fittings could be totally discarded and fittings as suitable but far more staple used in their place. The idiosyncrasies of individuals, including manufacturers, jobbers and plumbers, no doubt, also have a great deal to do with present multiplication of patterns and their continued use.

A far more important effect upon the simplification of the soil-pipe fitting line would be had by the making uniform of requirements of different cities, and a standardization of practice as well as materials.

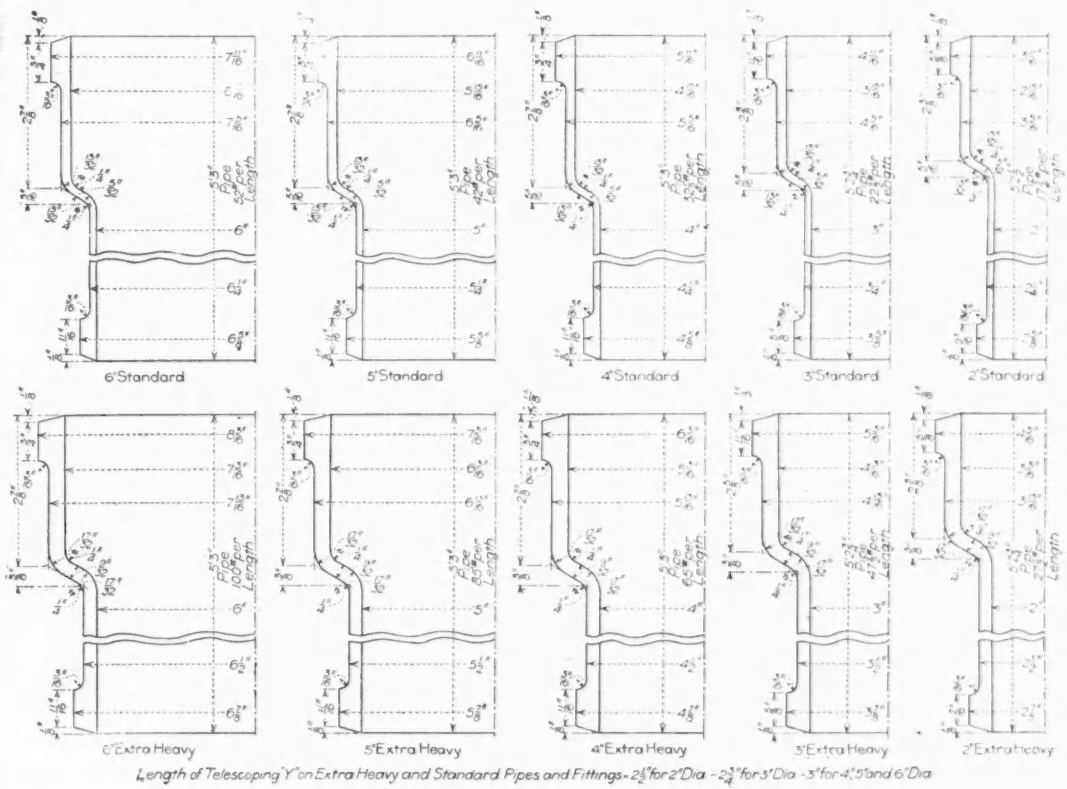
Important Results to Be Attained by Standardization.

The most important and far-reaching feature of the standardization of soil-pipe fittings is the adoption of a minimum weight for each fitting. This figure can only be properly obtained after all other details have been worked out. With soil-pipe weights this necessity did not prevail because of the case of varying the weight by means of the readily changed core. With fittings the case is different, and once the pattern is made the weight of the resultant casting is definitely fixed, nor can minor changes in fitting patterns be made without so great an expense that the making of a new pattern is usually preferable.

The most serious result of the present lack of uniformity and standard is the extreme variation in weight, tending always to a lower figure, brought about by keen competition among manufacturers in the absence of any regulations or standard.

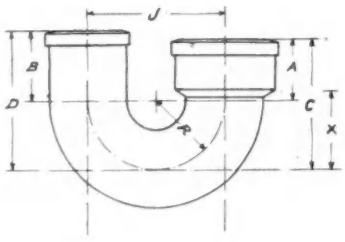
Requisites upon Which Standardization Should Be Based.

An adoption of a fixed minimum weight for each different fitting would necessitate the change from practically all existing patterns to the new ones, and this would involve a very great expense upon every manufacturer,


6"Standard
5"Standard
4"Standard
3"Standard
2"Standard
6"Extra Heavy
5"Extra Heavy
4"Extra Heavy
3"Extra Heavy
2"Extra Heavy
Length of Telescoping "Y" on Extra Heavy and Standard Pipes and Fittings - 2⅝" for 2" Dia. - 2¾" for 3" Dia. - 3" for 4", 5" and 6" Dia.

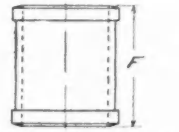
Proposed Dimension of Standard and Extra-Heavy Pipe.

*Paper presented by request at the sixth meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers, at Milwaukee, Wis., February 6, 7 and 8, 1911.



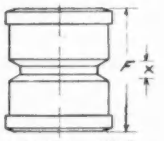
RETURN OR ½ BEND

SIZE	A	B	C	D	J	R	X	WEIGHT STD	WEIGHT X.H
2"	3	4	6	7	6	3	3½	4¾	9¼
3"	3¼	4	6¼	7½	7	3½	4	7½	14¼
4"	3½	4	7½	8	8	4	4½	10¾	20¼
5"	3½	4	8	8½	9	4½	5	14	26½
6"	3½	4	8½	9	10	5	5½	17½	33½



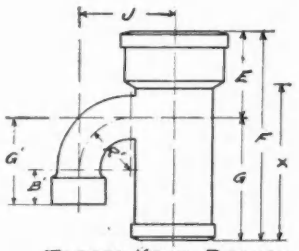
STRAIGHT SLEEVE

SIZE	F	WEIGHT STD	WEIGHT X.H
2"	6	3½	6¼
3"	6½	5	8½
4"	7	6¾	11¼
5"	7	8¼	13¼
6"	7	9½	15¼



DOUBLE HUB

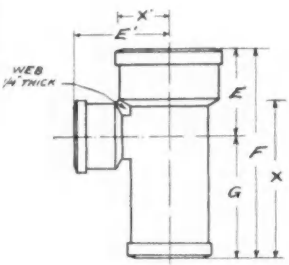
SIZE	F	X	WEIGHT STD	WEIGHT X.H.
2"	6	1	3¼	5¾
3"	6½	1	4¾	8¼
4"	7	1	6½	10¾
5"	7	1	7¾	12¾
6"	7	1	9	14¾



TAPPED VENT BRANCH

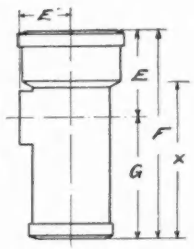
SIZE	B'	E	F	G	G'	J	R'	X	WEIGHT STD.	WEIGHT X.H
2"x2"	2	5	11½	7	5	4½	3	9	6½	11¾
3"x2"	2	5	11¾	7	5	5	3	9	8¼	14¼
4"x2"	2	5	12	7	5	5½	3	9	10¾	17½
5"x2"	2	5	12	7	5	6	3	9	11¾	20¼
6"x2"	2	5	12	7	5	6½	3	9	13¾	23

TAPPING BOSS ON FITTINGS MAY BE TAPPED FOR 1¼" TO 2" PIPE THREADS INCLUSIVE.



"T" BRANCH

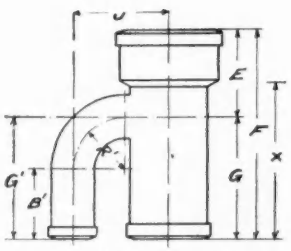
SIZE	E	E'	F	G	X	X'	WEIGHT STD.	WEIGHT X.H.
2"	4½	4½	11½	7	9	2	5½	10¼
3"	5¼	5¼	12¾	7½	10	2½	8¼	15¼
4"	6	6	14	8	11	3	11½	21
5"	6½	6½	15	8½	12	3½	14½	26½
6"	7	7	16	9	13	4	17¾	32½
3"x2"	4¾	5	11¾	7	9	2½	7¼	13¼
4"x2"	5	5½	12	7	9	3	9	16½
4"x3"	5½	5¾	13	7½	10	3	10¼	18¾
5"x2"	5	6	12	7	9	3½	10¼	19¼
5"x3"	5½	6¼	13	7½	10	3½	12	22
5"x4"	6	6½	14	8	11	3½	13½	24½
6"x2"	5	6½	12	7	9	4	12¼	22½
6"x3"	5½	6¾	13	7½	10	4	13¾	25
6"x4"	6	7	14	8	11	4	15¼	27½
6"x5"	6½	7	15	8½	12	4	16½	30



TAPPED "T" BRANCH

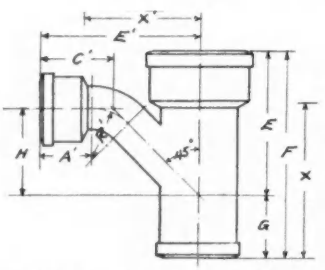
SIZE	E	E'	F	G	X	WEIGHT STD	WEIGHT X.H.
2"x2"	4½	2	11½	7	9	5½	8¼
3"x2"	4¾	2½	11¾	7	9	7¼	11¼
4"x2"	5	3	12	7	9	9	15
5"x2"	5	3½	12	7	9	10½	17¾
6"x2"	5	4	12	7	9	12¼	20½

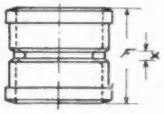
TAPPING BOSS ON FITTINGS MAY BE TAPPED FOR 1¼" TO 2" PIPE THREADS INCLUSIVE.



VENT BRANCH

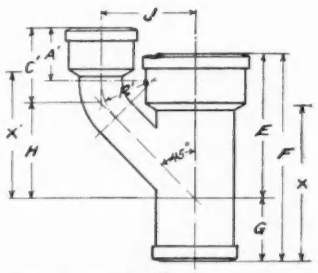
SIZE	B'	E	F	G	G'	J	R'	X	WEIGHT STD.	WEIGHT X.H
2"	4	4½	11½	7	7	4½	3	9	6	11½
3"	4	5¼	12¾	7½	7½	5½	3½	10	9½	17¾
4"	4	6	14	8	8	6½	4	11	13¼	25
5"	4	6½	15	8½	8½	7½	4½	12	17¼	32½
6"	4	7	16	9	9	8½	5	13	21½	41
3"x2"	4	4¾	11¾	7	7	5	3	9	7¾	14¾
4"x2"	4	5	12	7	7	5½	3	9	9½	17¾
4"x3"	4	5½	13	7½	7½	6	3½	10	11¼	21½
5"x2"	4	5	12	7	7	6	3	9	11¼	21
5"x3"	4	5½	13	7½	7½	6½	3½	10	13	24½
5"x4"	4	6	14	8	8	7	4	11	15	28½
6"x2"	4	5	12	7	7	6½	3	9	12¾	23½
6"x3"	4	5½	13	7½	7½	7	3½	10	14¾	27½
6"x4"	4	6	14	8	8	7½	4	11	16¾	31½
6"x5"	4	6½	15	8½	8½	8	4½	12	19	36





SHORT DOUBLE HUB OR SINGLE HUB

SIZE	F	X	WEIGHT STD	WEIGHT X.H
2"	4½	½	2¾	4¾
3"	5	½	4¼	6¾
4"	5½	½	5¾	9¼
5"	5½	½	6¾	10¾
6"	5½	½	7¾	12½



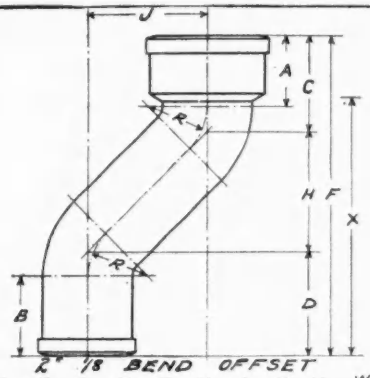
COMBINATION "Y" AND ⅛ BEND

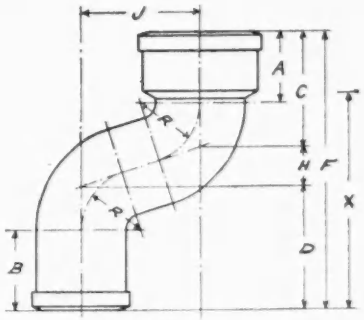
SIZE	A'	C'	E	E'	F	G	H	R'	X	X'	WEIGHT STD.	WEIGHT X.H.
2"	3	4¼	6¾	7⅜	11½	4¾	3½	3	9	5¾	6¼	12
3"	3¼	4⅛	8¼	9⅛	13¼	5	4⅜	3½	10½	6½	10	18¼
4"	3½	5⅛	9¾	10¾	15	5¼	5⅜	4	12	7¾	14½	27
5"	3½	5⅞	11	12	16½	5½	6⅝	4½	13½	9	18¾	35
6"	3½	5⅞	12¼	13⅛	18	5¾	7⅛	5	15	10¼	24	44½
3"x2"	3	4¼	7⅛	8⅛	11¾	4⅛	4	3	9	5⅜	8	15
4"x2"	3	4⅛	8⅞	9⅞	12	3⅛	4½	3	9	6¼	10	18¼
4"x3"	3¼	4⅛	9	9¾	13½	4½	5⅛	3½	10½	7	12	22½
5"x2"	3	4¼	8⅝	9¼	12	3⅜	5	3	9	6⅝	11½	21
5"x3"	3¼	4⅛	9½	10¼	13½	4	5⅛	3½	10½	7½	13¾	25½
5"x4"	3½	5⅛	10¼	11¼	15	4¾	6⅛	4	12	8¼	16¼	30½
6"x2"	3	4⅛	9⅝	9¾	12	2⅞	5½	3	9	7¼	13¼	24
6"x3"	3¼	4⅜	10	10¾	13½	3½	6⅛	3½	10½	8	15½	29
6"x4"	3½	5⅛	10¼	11⅜	15	4¼	6⅞	4	12	8¾	18¼	34
6"x5"	3½	5⅞	11⅞	12½	16½	5⅛	7⅞	4½	13½	9½	21	39

UPRIGHT "Y" BRANCH

SIZE	A'	C'	E	F	G	H	J	R'	X	X'	WEIGHT STD.	WEIGHT X.H.
2"	3	4¼	6¾	11½	4¾	4½	4½	3	9	6¼	6¾	12½
3"	3¼	4⅛	8¼	13¼	5	5½	5½	3½	10½	7⅞	10½	19½
4"	3½	5⅛	9¾	15	5¼	6½	6½	4	12	8⅞	15	28
5"	3½	5⅞	11	16½	5½	7½	7½	4½	13½	9⅞	19½	36½
6"	3½	5⅞	12¾	18	5¾	8½	8½	5	15	11⅛	24½	46
3"x2"	3	4¼	7⅞	11¾	4⅛	5	5	3	9	6¾	8½	15¼
4"x2"	3	4¼	8⅝	12	3⅛	5½	5½	3	9	7¼	10¼	18¼
4"x3"	3¼	4⅛	9	13½	4½	6	6	3½	10½	7⅞	12½	23
5"x2"	3	4¼	8⅝	12	3⅜	6	6	3	9	7¾	11¾	21½
5"x3"	3¼	4⅛	9½	13½	4	6½	6½	3½	10½	8⅜	14¼	26½
5"x4"	3½	5⅛	10¼	15	4¾	7	7	4	12	9⅛	16¾	31½
6"x2"	3	4¼	9⅝	12	2⅞	6½	6½	3	9	8¼	13½	24½
6"x3"	3¼	4⅜	10	13½	3½	7	7	3½	10½	8⅝	16	29½
6"x4"	3½	5⅛	10¼	15	4¼	7½	7½	4	12	9⅛	18¾	35
6"x5"	3½	5⅞	11⅛	16½	5⅛	8	8	4½	13½	10⅛	21½	40

Table of Dimensions of Proposed Standard Return Bends and Other Fittings.





2" 1/8 BEND OFFSET

SIZE	A	B	C	D	F	H	J	R	X	WEIGHT STD.	WEIGHT X.H.
2"x2"	3	3 3/8	3 9/16	4 9/16	10 1/2	2	2	2	8	3 1/4	7
2"x4"	"	"	"	"	12 1/2	4	4	"	10	4 1/4	8 1/4
2"x6"	"	"	"	"	14 1/2	6	6	"	12	5	9 1/2
2"x8"	"	"	"	"	16 1/2	8	8	"	14	5 1/2	10 3/4
2"x10"	"	"	"	"	18 1/2	10	10	"	16	6 1/4	12
2"x12"	"	"	"	"	20 1/2	12	12	"	18	6 3/4	13 1/4
2"x14"	"	"	"	"	22 1/2	14	14	"	20	7 1/2	14 3/4
2"x16"	"	"	"	"	24 1/2	16	16	"	22	8	16
2"x18"	"	"	"	"	26 1/2	18	18	"	24	8 3/4	17 1/4
2"x20"	"	"	"	"	28 1/2	20	20	"	26	9 1/4	18 1/2
2"x22"	"	"	"	"	30 1/2	22	22	"	28	10	19 3/4
2"x24"	"	"	"	"	32 1/2	24	24	"	30	10 1/2	21

2" OFFSET

SIZE	A	B	C	D	F	H	J	R	X	WEIGHT STD.	WEIGHT X.H.
2"x2"	3	3 1/8	3 9/16	4 9/16	10 1/2	2	2	2	8	3 1/4	7
2"x4"	"	"	4 9/16	5 9/16	11	1	4	"	8 1/2	4 1/4	8
2"x6"	"	"	"	"	11 1/2	1 1/2	6	"	9	4 1/2	9
2"x8"	"	"	"	"	12	2	8	"	9 1/2	5	9 3/4
2"x10"	"	"	"	"	12 1/2	2 1/2	10	"	10	5 1/2	10 3/4
2"x12"	"	"	"	"	13	3	12	"	10 1/2	6	11 1/4
2"x14"	"	"	"	"	13 1/2	3 1/2	14	"	11	6 1/2	12 3/4
2"x16"	"	"	"	"	14	4	16	"	11 1/2	6 3/4	13 3/4
2"x18"	"	"	"	"	14 1/2	4 1/2	18	"	12	7 1/4	14 1/2
2"x20"	"	"	"	"	15	5	20	"	12 1/2	7 3/4	15 1/2
2"x22"	"	"	"	"	15 1/2	5 1/2	22	"	13	8 1/4	16 1/2
2"x24"	"	"	"	"	16	6	24	"	13 1/2	8 3/4	17 1/2

3" 1/8 BEND OFFSET

SIZE	A	B	C	D	F	H	J	R	X	WEIGHT STD.	WEIGHT X.H.
3"x2"	3 1/4	3 7/8	4 9/16	4 9/16	11 1/4	2	2	2 1/2	8 1/2	5 1/2	10 1/4
3"x4"	"	"	"	"	13 1/4	4	4	"	10 1/2	6 1/2	12
3"x6"	"	"	"	"	15 1/4	6	6	"	12 1/2	7 1/4	14
3"x8"	"	"	"	"	17 1/4	8	8	"	14 1/2	8 1/4	15 3/4
3"x10"	"	"	"	"	19 1/4	10	10	"	16 1/2	9	17 3/4
3"x12"	"	"	"	"	21 1/4	12	12	"	18 1/2	10	19 1/2
3"x14"	"	"	"	"	23 1/4	14	14	"	20 1/2	11	21 1/2
3"x16"	"	"	"	"	25 1/4	16	16	"	22 1/2	11 3/4	23 1/2
3"x18"	"	"	"	"	27 1/4	18	18	"	24 1/2	12 3/4	25 1/2
3"x20"	"	"	"	"	29 1/4	20	20	"	26 1/2	13 1/2	27
3"x22"	"	"	"	"	31 1/4	22	22	"	28 1/2	14 1/2	29
3"x24"	"	"	"	"	33 1/4	24	24	"	30 1/2	15 1/2	31

3" OFFSET

SIZE	A	B	C	D	F	H	J	R	X	WEIGHT STD.	WEIGHT X.H.
3"x2"	3 1/4	3 1/8	4 9/16	4 9/16	11 1/4	2	2	2 1/2	8 1/2	5 1/2	10 1/4
3"x4"	"	4 1/8	5 9/16	6 1/16	12 1/4	1	4	"	9 1/2	6 1/4	12
3"x6"	"	"	"	"	12 3/4	1 1/2	6	"	10	7	13 1/4
3"x8"	"	"	"	"	13 1/4	2	8	"	10 1/2	7 3/4	14 3/4
3"x10"	"	"	"	"	13 3/4	2 1/2	10	"	11	8 1/4	16
3"x12"	"	"	"	"	14 1/4	3	12	"	11 1/2	9	17 1/2
3"x14"	"	"	"	"	14 3/4	3 1/2	14	"	12	9 3/4	18 3/4
3"x16"	"	"	"	"	15 1/4	4	16	"	12 1/2	10 1/4	20 1/2
3"x18"	"	"	"	"	15 3/4	4 1/2	18	"	13	11	21 1/2
3"x20"	"	"	"	"	16 1/4	5	20	"	13 1/2	11 1/2	23
3"x22"	"	"	"	"	16 3/4	5 1/2	22	"	14	12 1/4	24 1/2
3"x24"	"	"	"	"	17 1/4	6	24	"	14 1/2	13	26

4" 1/8 BEND OFFSET

SIZE	A	B	C	D	F	H	J	R	X	WEIGHT STD.	WEIGHT X.H.
4"x2"	3 1/2	4	4 3/4	5 1/4	12	2	2	3	9	7 1/2	13 3/4
4"x4"	"	"	"	"	14	4	4	"	11	8 3/4	16 1/4
4"x6"	"	"	"	"	16	6	6	"	13	10	18 3/4
4"x8"	"	"	"	"	18	8	8	"	15	11	21
4"x10"	"	"	"	"	20	10	10	"	17	12 1/4	23 1/2
4"x12"	"	"	"	"	22	12	12	"	19	13 1/2	26
4"x14"	"	"	"	"	24	14	14	"	21	14 3/4	28 1/2
4"x16"	"	"	"	"	26	16	16	"	23	15 3/4	31
4"x18"	"	"	"	"	28	18	18	"	25	17	33 1/2
4"x20"	"	"	"	"	30	20	20	"	27	18 1/4	36
4"x22"	"	"	"	"	32	22	22	"	29	19 1/4	38 1/2
4"x24"	"	"	"	"	34	24	24	"	31	20 1/2	41

4" OFFSET

SIZE	A	B	C	D	F	H	J	R	X	WEIGHT STD.	WEIGHT X.H.
4"x2"	3 1/2	4	4 3/4	5 1/4	12	2	2	3	9	7 1/2	13 3/4
4"x4"	"	"	"	"	14	4	4	"	11	8 3/4	16 1/4
4"x6"	"	4 1/4	5 7/8	6 5/8	14	1 1/2	6	"	11	9 1/2	18
4"x8"	"	"	"	"	14 1/2	2	8	"	11 1/2	10 1/2	19 3/4
4"x10"	"	"	"	"	15	2 1/2	10	"	12	11 1/4	21 1/2
4"x12"	"	"	"	"	15 1/2	3	12	"	12 1/2	12	23 1/2
4"x14"	"	"	"	"	16	3 1/2	14	"	13	13	25
4"x16"	"	"	"	"	16 1/2	4	16	"	13 1/2	13 3/4	27
4"x18"	"	"	"	"	17	4 1/2	18	"	14	14 3/4	29
4"x20"	"	"	"	"	17 1/2	5	20	"	14 1/2	15 1/2	30 1/2
4"x22"	"	"	"	"	18	5 1/2	22	"	15	16 1/2	32 1/2
4"x24"	"	"	"	"	18 1/2	6	24	"	15 1/2	17 1/4	34

5" 1/8 BEND OFFSET

SIZE	A	B	C	D	F	H	J	R	X	WEIGHT STD.	WEIGHT X.H.
5"x2"	3 1/2	4 1/8	4 9/16	5 9/16	12 1/2	2	2	3 1/2	9 1/2	9 1/2	17 1/4
5"x4"	"	"	"	"	14 1/2	4	4	"	11 1/2	11	20 1/2
5"x6"	"	"	"	"	16 1/2	6	6	"	13 1/2	12 1/2	23 1/2
5"x8"	"	"	"	"	18 1/2	8	8	"	15 1/2	14	26 1/2
5"x10"	"	"	"	"	20 1/2	10	10	"	17 1/2	15 1/4	29 1/2
5"x12"	"	"	"	"	22 1/2	12	12	"	19 1/2	16 3/4	32 1/2
5"x14"	"	"	"	"	24 1/2	14	14	"	21 1/2	18 1/4	35 1/2
5"x16"	"	"	"	"	26 1/2	16	16	"	23 1/2	19 3/4	38 1/2
5"x18"	"	"	"	"	28 1/2	18	18	"	25 1/2	21 1/2	41 1/2
5"x20"	"	"	"	"	30 1/2	20	20	"	27 1/2	23	44 1/2
5"x22"	"	"	"	"	32 1/2	22	22	"	29 1/2	24	47 1/2
5"x24"	"	"	"	"	34 1/2	24	24	"	31 1/2	25 1/2	50 1/2

5" OFFSET

SIZE	A	B	C	D	F	H	J	R	X	WEIGHT STD.	WEIGHT X.H.
5"x2"	3 1/2	4 1/8	4 9/16	5 9/16	12 1/2	2	2	3 1/2	9 1/2	9 1/2	17 1/4
5"x4"	"	"	"	"	14 1/2	4	4	"	11 1/2	11	20 1/2
5"x6"	"	4 1/2	6 1/4	7 1/4	15	1 1/2	6	"	12	12	22 1/2
5"x8"	"	"	"	"	15 1/2	2	8	"	12 1/2	13	25
5"x10"	"	"	"	"	16	2 1/2	10	"	13	14 1/4	27
5"x12"	"	"	"	"	16 1/2	3	12	"	13 1/2	15 1/4	29 1/2
5"x14"	"	"	"	"	17	3 1/2	14	"	14	16 1/4	31 1/2
5"x16"	"	"	"	"	17 1/2	4	16	"	14 1/2	17 1/2	33 1/2
5"x18"	"	"	"	"	18	4 1/2	18	"	15	18 1/2	36
5"x20"	"	"	"	"	18 1/2	5	20	"	15 1/2	19 1/2	38
5"x22"	"	"	"	"	19	5 1/2	22	"	16	20 1/2	40 1/2
5"x24"	"	"	"	"	19 1/2	6	24	"	16 1/2	22	42 1/2

6" 1/8 BEND OFFSET

SIZE	A	B	C	D	F	H	J	R	X	WEIGHT STD.	WEIGHT X.H.
6"x2"	3 1/2	4 1/8	5	5 5/8	13	2 3/8	2	4	10	11 1/4	21
6"x4"	"	"	5 9/16	5 11/16	15	4	4	"	12	13	24 1/2
6"x6"	"	"	"	"	17	6	6	"	14	14 3/4	28
6"x8"	"	"	"	"	19	8	8	"	16	16 1/2	31 1/2
6"x10"	"	"	"	"	21	10	10	"	18	18 1/2	35 1/2
6"x12"	"	"	"	"	23	12	12	"	20	20 1/2	39
6"x14"	"	"	"	"	25	14	14	"	22	22	42 1/2
6"x16"	"	"	"	"	27	16	16	"	24	24	46
6"x18"	"	"	"	"	29	18	18	"	26	25 1/2	49 1/2
6"x20"	"	"	"	"	31	20	20	"	28	27	53 1/2
6"x22"	"	"	"	"	33	22	22	"	30	29	57
6"x24"	"	"	"	"	35	24	24	"	32	30 1/2	60 1/2

6" OFFSET

SIZE	A	B	C	D	F	H	J	R	X	WEIGHT STD.	WEIGHT X.H.
6"x2"	3 1/2	4 1/8	5	5 5/8	13	2 3/8	2	4	10	11 1/4	21
6"x4"	"	"	5 9/16	5 11/16	15	4	4	"	12	13	24 1/2
6"x6"	"	4 1/4	6 1/8	7 1/8	16	1 1/2	6	"	13	14 3/4	28
6"x8"	"	"	"	"	16 1/2	2	8	"	13 1/2	16	30 1/2
6"x10"	"	"	"	"	17	2 1/2	10	"	14	17 1/4	33
6"x12"	"	"	"	"	17 1/2	3	12	"	14 1/2	18 1/2	35 1/2
6"x14"	"	"	"	"	18	3 1/2	14	"	15	19 3/4	38 1/2
6"x16"	"	"	"	"	18 1/2	4	16	"	15 1/2	21	41
6"x18"	"	"	"	"	19	4 1/2	18	"	16	22 1/2	43 1/2
6"x20"	"	"	"	"	19 1/2	5	20	"	16 1/2	24	46 1/2
6"x22"	"	"	"	"	20	5 1/2	22	"	17	25	49
6"x24"	"	"	"	"	20 1/2	6	24	"	17 1/2	26 1/2	51 1/2

Table of Dimensions of Proposed Standard Offsets.

whether he made the patterns or obtained them elsewhere. No manufacturer would be warranted in making any such expenditure if he were in doubt as to the market which would obtain for the new fittings. There must be no compromise with expediency when it comes to public health, but in so far as existing methods have shown the way the less of novelty and the more of present practice which is incorporated in any plan of standardization, the more likely will be its prompt adoption. No society, no matter how influential, can without great expenditure of time and labor cause its findings to be accepted as a standard in any well-defined line of business except that they are not at variance with the best of existing practice. By this is meant no plea for the adoption of short-length or light-weight fittings or others admittedly bad practice. Fittings should unquestionably have the same wall thickness as the pipe itself.

With the above in mind, the following is suggested as not conflicting with existing methods, but embodying remedies for the present deplorable lack of uniform conditions as to weights and details of soil-pipe fittings.

Because of the fact that some important cities still permit the use of Standard and Medium pipe and fittings, these have been included in the present paper. Their use should be discouraged, and wherever possible done away with. Medium pipe and fittings are a poor compromise between Standard and Heavy, without effecting any material economy to the purchaser, and being a considerable hardship on the manufacturer if he conscientiously endeavors to get out a special line of Medium pipe and fittings. Owing to the very restricted call for this weight, no manufacturer is warranted in carrying any considerable stock on hand. It would also be unwise to endeavor to standardize without Standard fittings, since they have suffered diminution in length, hub length and calking room from competition, as Extra-Heavy fittings have suffered diminution in weight from the same cause.

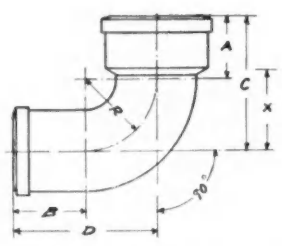
The lead space on all fittings is made the same, but the depth of hub has been increased on larger pipe for the reason that often in installing necessity requires that pipe be laid not in a straight line, with the result that on larger pipe the full depth of hub, unless increased, is not fully effective.

All traps have a seal of 2½ in. (Cleveland requires this depth seal). A great many reducing fittings are listed which could be undoubtedly replaced by non-reducing ones used with reducers.

The details of fittings not shown are quite well indicated, and with the wall thickness, hub depth and calking room prescribed cannot fall short of what is desired.

There has been incorporated in this proposal no different method of connection than that which has been employed for years, and is now being exclusively employed, in the absence of any other point having had adequate and extensive use under the very different situations and difficult conditions of house-drainage to prove its superiority. No other course would seem open if essential co-operation for any plan for standardization is to be obtained. Contraction and expansion cannot be prevented, and a joint to be successful must be able to adjust itself to the variations created. The long-adopted joint used for connecting cast-iron soil-pipe allows of this perhaps too freely, but it is unquestionably superior to any joint which will allow no longitudinal movement.

It might seem an easy matter to obtain in the measurements of given fittings of different sizes a regular difference in measurement between each succeeding size. This point has been given careful consideration and where possible has been adopted. However, in many instances it has been found that this plan would result in some fit-



¼ BEND

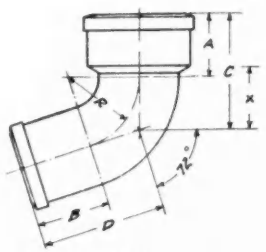
SIZE	A	B	C	D	R	X	WEIGHT STD.	WEIGHT X.H.
2"	3	4	6	7	3	3½	3¾	7¼
3"	3¼	4	6¾	7½	3½	4	5¾	10¼
4"	3½	4	7½	8	4	4½	8	15
5"	3½	4	8	8½	4½	5	10¼	19
6"	3½	4	8½	9	5	5½	12½	23½

SHORT SWEEP ¼ BEND

SIZE	A	B	C	D	R	X	WEIGHT STD.	WEIGHT X.H.
2"	3	4	8	9	5	5½	4½	8½
3"	3¼	4	8¾	9½	5½	6	6¾	13
4"	3½	4	9½	10	6	6½	9½	17¾
5"	3½	4	10	10½	6½	7	12	22½
6"	3½	4	10½	11	7	7½	14½	27½

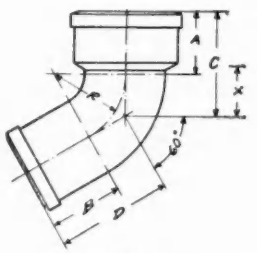
LONG SWEEP ¼ BEND

SIZE	A	B	C	D	R	X	WEIGHT STD.	WEIGHT X.H.
2"	3	4	11	12	8	8½	5½	10¾
3"	3¼	4	11¾	12½	8½	9	8¼	16
4"	3½	4	12½	13	9	9½	11½	22
5"	3½	4	13	13½	9½	10	14¾	27½
6"	3½	4	13½	14	10	10½	17½	33½



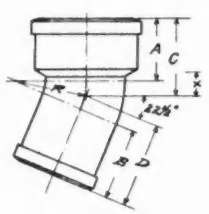
⅕ BEND

SIZE	A	B	C	D	R	X	WEIGHT STD.	WEIGHT X.H.
2"	3	4	5 1/16	6 1/16	3	2 1/16	3½	6¾
3"	3¼	4	5 1/16	6 1/16	3½	3 1/16	5½	10
4"	3½	4	6 1/16	6 1/16	4	3 1/16	7½	13¾
5"	3½	4	6¾	7¼	4½	3¾	9½	17½
6"	3½	4	7⅛	7 5/16	5	4⅛	11¾	21½



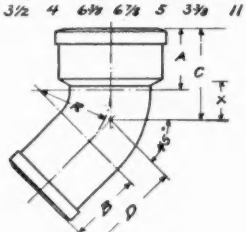
⅙ BEND

SIZE	A	B	C	D	R	X	WEIGHT STD.	WEIGHT X.H.
2"	3	4	4 1/16	5 1/16	3	2 1/16	3½	6½
3"	3¼	4	5 1/16	6	3½	2½	5¼	9½
4"	3½	4	5 1/16	6 5/16	4	2 5/16	7¼	13
5"	3½	4	6½	6 5/16	4½	3⅛	9	16½
6"	3½	4	6 1/16	6 7/16	5	3⅛	11	20



1/16 BEND

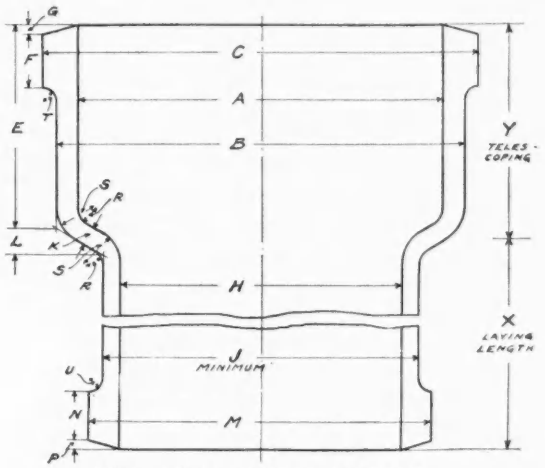
SIZE	A	B	C	D	R	X	WEIGHT STD.	WEIGHT X.H.
2"	3	4	3 5/16	4 5/16	3	1⅛	3	5½
3"	3¼	4	3 5/16	4 5/16	3½	1 5/16	4½	8
4"	3½	4	4 5/16	4 5/16	4	1 5/16	6	10¾
5"	3½	4	4⅜	4⅝	4½	1 9/16	7½	13¼
6"	3½	4	4½	5	5	1½	9	15¾



⅛ BEND

SIZE	A	B	C	D	R	X	WEIGHT STD.	WEIGHT X.H.
2"	3	4	4 1/16	5 1/16	3	1 1/16	3¼	6
3"	3¼	4	4 1/16	5 1/16	3½	1 5/16	5	9
4"	3½	4	5 1/16	5 1/16	4	2 3/16	6¾	12¼
5"	3½	4	5⅛	5⅞	4½	2⅜	8½	15¼
6"	3½	4	5 7/16	6 1/16	5	2 9/16	10¼	18¼

Table of Dimensions of Proposed Standard Bends.



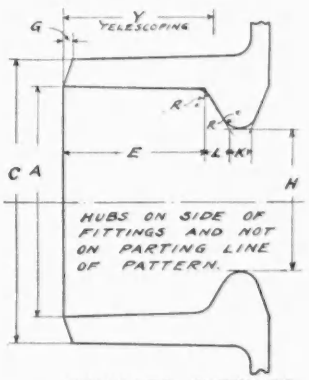
SOIL PIPE HUBS & SPIGOTS.
DIMENSIONS OF FITTING HUBS & SPIGOTS SAME AS ABOVE.

STANDARD PIPE

SIZE	A	B	C	E	F	G	H	MIN WALL	J	K	L	M	N	P	R	S	T	U	X	Y	WGT PER LENGTH
2"	2 5/16	3 9/16	3 1/16	2 3/8	9/16	1/8	2	1/8	2 1/4	5/32	5/16	2 5/8	9/16	1/8	1/4	13/32	3/16	3/16	60	2 1/2	17 1/2
3"	3 1/16	4 5/16	4 1/16	2 5/8	11/16	"	3	"	3 1/4	"	"	3 5/8	5/8	"	"	"	"	"	"	2 3/4	22 1/2
4"	4 1/8	5 5/16	5 1/16	2 7/8	3/4	"	4	"	4 1/4	"	"	4 5/8	11/16	"	"	"	"	"	"	3	32 1/2
5"	5 1/16	6 5/16	6 1/16	"	"	"	5	"	5 1/4	"	"	5 5/8	"	"	"	"	"	"	"	"	42
6"	6 5/16	7 5/16	7 1/16	"	"	"	6	"	6 1/4	"	"	6 5/8	"	"	"	"	"	"	"	"	52

EXTRA HEAVY PIPE

SIZE	A	B	C	E	F	G	H	MIN WALL	J	K	L	M	N	P	R	S	T	U	X	Y	WGT. PER LENGTH
2"	3 3/16	3 7/16	4 3/16	2 3/8	5/8	1/8	2	1/4	2 1/2	9/32	3/8	2 7/8	9/16	1/8	1/4	17/32	3/16	3/16	60	2 1/2	27 1/2
3"	4 3/16	4 7/16	5 3/16	2 5/8	11/16	"	3	"	3 1/2	"	"	3 7/8	5/8	"	"	"	"	"	"	2 3/4	47 1/2
4"	5 3/16	5 7/16	6 3/16	2 7/8	3/4	"	4	"	4 1/2	"	"	4 7/8	11/16	"	"	"	"	"	"	3	65
5"	6 3/16	6 7/16	7 3/16	"	"	"	5	"	5 1/2	"	"	5 7/8	"	"	"	"	"	"	"	"	85
6"	7 3/16	7 7/16	8 3/16	"	"	"	6	"	6 1/2	"	"	6 7/8	"	"	"	"	"	"	"	"	100

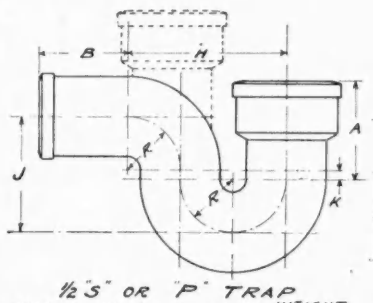


STANDARD FITTINGS

SIZE	A	C	E	G	H	K	L	R	Y
2"	3	3 1/2	2	1/8	2	9/16	9/16	1/4	2 1/4
3"	4	4 1/2	2 1/4	"	3	"	"	"	2 1/2
4"	5	5 1/2	2 1/2	"	4	"	"	"	2 3/4
5"	6	6 1/2	"	"	5	"	"	"	"
6"	7	7 1/2	"	"	6	"	"	"	"

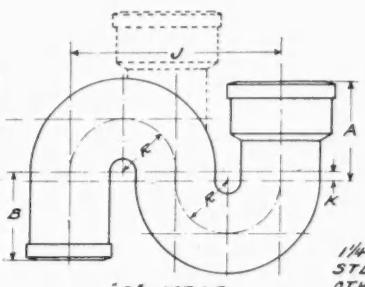
EXTRA HEAVY FITTINGS

SIZE	A	C	E	G	H	K	L	R	Y
2"	3 1/4	4	2	1/8	2	9/16	3/8	3/4	2 1/4
3"	4 1/16	5	2 1/4	"	3	"	"	"	2 1/2
4"	5 1/4	6	2 1/2	"	4	"	"	"	2 3/4
5"	6 1/4	7	"	"	5	"	"	"	"
6"	7 1/4	8	"	"	6	"	"	"	"



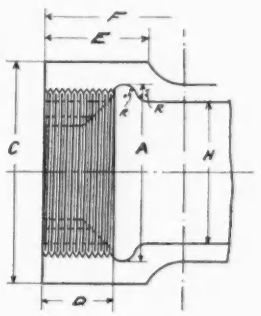
½ "S" OR "P" TRAP

SIZE	A	B	H	J	K	R	WEIGHT STD	WEIGHT X.H.
2"	3 1/2	5	6	4 1/2	1/2	2	5 1/2	10 1/2
3"	4 1/2	5	7 1/2	5 1/2	1/2	2 1/2	8 3/4	17 1/4
4"	5 1/2	5	9	6 1/2	1/2	3	13	25 1/2
5"	6 1/2	5	10 1/2	7 1/2	1/2	3 1/2	17 3/4	34 1/2
6"	7 1/2	5	12	8 1/2	1/2	4	23 1/2	45



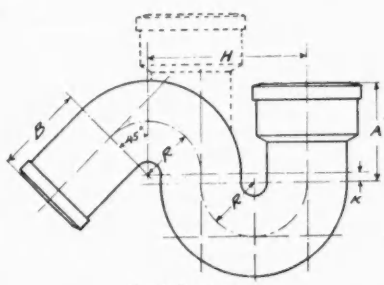
"S" TRAP

SIZE	A	B	J	K	R	WEIGHT STD.	WEIGHT X.H.
2"	3 1/2	5	8	1/2	2	6	12
3"	4 1/2	5	10	1/2	2 1/2	10	20
4"	5 1/2	5	12	1/2	3	15	30
5"	6 1/2	5	14	1/2	3 1/2	20 1/2	40 1/2
6"	7 1/2	5	16	1/2	4	27	53 1/2



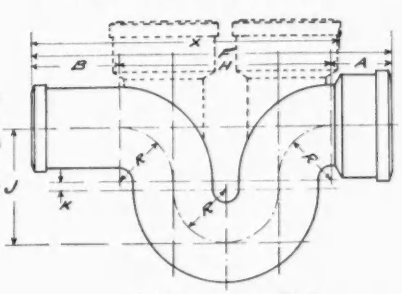
1¼" TO 2" TAPPING BOSS ON STD & X.H TAPPED FITTINGS OTHER THAN TEES & CROSSES

SIZE	A	C	D	E	F	H	R	LENGTH OF THD
1¼"	2 1/2	3 1/8	1	1 1/2	2	2	3/16	3/4
1½"	"	"	"	"	"	"	"	7/8
2"	"	"	"	"	"	"	"	1



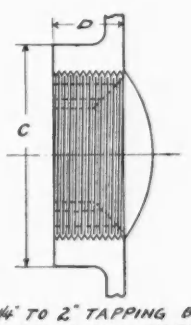
¾ "S" TRAP

SIZE	A	B	H	K	R	WEIGHT STD	WEIGHT X.H.
2"	3 1/2	5	6	1/2	2	5 3/4	11 1/4
3"	4 1/2	5	7 1/2	1/2	2 1/2	9 1/2	18 1/2
4"	5 1/2	5	9	1/2	3	14	27 1/2
5"	6 1/2	5	10 1/2	1/2	3 1/2	19 1/4	37 1/2
6"	7 1/2	5	12	1/2	4	25	49



RUNNING TRAP

SIZE	A	B	F	H	J	K	R	X	WEIGHT STD.	WEIGHT X.H.
2"	3	5	16	8	4 1/2	1/2	2	13 1/2	6	11 3/4
3"	3 1/4	5	18 1/4	10	5 1/2	1/2	2 1/2	15 1/2	9 3/4	19
4"	3 1/2	5	20 1/2	12	6 1/2	1/2	3	17 1/2	14 1/4	27 1/2
5"	3 1/2	5	22 1/2	14	7 1/2	1/2	3 1/2	19 1/2	19	37
6"	3 1/2	5	24 1/2	16	8 1/2	1/2	4	21 1/2	24 1/2	48



1¼" TO 2" TAPPING BOSS ON STD & X.H. TAPPED TEES & CROSSES

SIZE	C	D	LENGTH OF THD
1¼"	3 1/8	1	3/4
1½"	"	"	7/8
2"	"	"	1

Table of Dimensions of Proposed Standard Hubs, Spigots and Traps.

ting being made greater in certain dimensions than is essential, and hence heavier and more expensive than need be. The present plan has been laid on the basis that, consistent with proper wall thickness, depths of hub, radii, calking room and other details, the fittings be as small and light as possible. Pipe is cheaper than fittings, and length can be, consequently, more cheaply obtained in the former. Without taking away any desirable sanitary feature or adding to the difficulty of installation, fittings should be as compact as possible. We cannot hope to have any plan succeed with manufacturers, jobbers and plumbers which loses sight of the economic feature in making the cost greater than is compatible with the objects in view.

Specifications Cast-Iron Soil-Pipe and Fittings of 2-in. to 6-in. Diameter.

"The drawings herein referred to, and which are presented in the accompanying illustrations, are those dated December 15, 1910. No. 1215101, 1215102, 1215103, 1215104, 1215105, 1215106 and 1215107.

"The pipe and fittings must be true to drawing. They must be sound, free from cracks, sand-holes and blow-holes and cold shuts. No filling with metal, cement or other material, or so-called burning on of iron is to be permitted. The pipe and fittings must be of uniform wall thickness and present at hub and spigot ends a true circle. The wall thickness for Extra-Heavy pipe and fittings shall not be less at any point than 1/32 in. less than ¼ in.; for Standard pipe and fittings, not less than 1/64 in. less than ⅛ in.

"The bore of all pipe and fittings must be smooth and free from fins and ridges, which restrict the full effective area of either the pipe or fittings.

"All pipe and fittings must be thoroughly milled and free from adhering sand. The iron must be of such composition and the condition of manufacture such that the resulting pipe and fittings are not hard, brittle nor difficult to cut with file or chisel.

"The uncoated and coated pipe and fittings must be such as to withstand without leakage a hydrostatic pressure of 50 lb. per square inch.

"All pipe and fittings must be marked with the manufacturer's name or designated initials. All castings must also show the card weight as indicated on the drawings, and whether the piece is standard, medium or extra heavy.

"The weight of pipe and fittings shall be taken as that of plain uncoated fittings, and the measurements, as for instance of wall thicknesses, shall be those of uncoated pipe and fittings.

"The regular length of pipe shall be such as to lay 5 ft.; including their hubs the average weight per lineal foot shall not be less than the following:

Table of Weights.

Diameter, inches	2.	3.	4.	5.	6.
Standard, pounds	3.5	4.5	6.5	8.4	10.4
Medium, pounds	4.0	6.0	9.0	12.0	15.0
Ex. Heavy, pounds	5.5	9.5	13.0	17.0	20.0

"Except that individual lengths may weigh 5 per cent less than designated above, but only when the average weight of ten lengths of a given size, grade and make selected at random weigh not less than given above.

"No fitting shall weigh less than 5 per cent below the schedule or drawing weight for same.

"Medium pipe and fittings when made shall have the same hubs and spigot ends as Standard pipe, excepting that the inside diameter or bore of 2 to 6 in. medium pipe and fittings will be ⅛ in. less than the full nominal bore of the respective sizes. The wall thickness of Medium fittings will be 3/16 in. In all other details, excepting the weight, Medium fittings will be the same as the drawings show for Standard fittings. The weight of Medium fittings shall be the mean between the weights of corresponding Extra Heavy and Standard fittings.

"The preferred method of coating is that of submerging the heated pieces in heated coal-tar at such temperatures and under such conditions that the resultant coating is adherent and glossy without either being brittle or soft.

"In the case of those less common fittings for which no drawings or estimated weights have been prepared, the same wall thickness and details of hubs and spigots are to be employed as are shown on the drawings for either Extra Heavy or Standard respectively. A fitting having a hub instead of a spigot, or vice versa, has the hub dimension A from point of tangent in place of the spigot dimension B, or vice versa. Tee-branches, all hubs are to be symmetrical; that is, dimension E is to be reproduced on the opposite end of the runner.

"Fittings with vent-side or heel inlets are to be of the same dimensions excepting added inlet as those shown in the drawings. Inlets, such as side or heel, centered upon the parting line, are to have the same hubs or spigots as regularly employed and shown in the drawings, but those inlets which occur off the parting lines are to have no beads, but the wall of the hub is to be as specially shown in the drawings.

"Long fittings have the same hubs and radii or other dimensions as those shown for the regular fittings, but the spigot end dimension B is extended. Long ¼ bends are measured from the inside of hub nearest spigot to end of spigot. Other long bends are measured from end of spigot to nearest point on inside base of hub. Long Tees, Ys, etc., are measured by taking the laying of the runners.

"Double bends, Tees and Ys are to be the same as single bends, Tees and Ys, excepting a symmetrical duplication of the branch on the opposite side."

The adoption of the above standardization will confer no advantage to any one manufacturer that will not be conferred to others. It embodies nothing that all manufacturers cannot utilize, one as well as the other. No manufacturer today, so far as the writer knows, is manufacturing a line of fittings nor has patterns which would conform to this proposed standard. All manufacturers would, therefore, in the event of its adoption, start on an even basis. It is intended to submit this plan to the various associations of plumbing supply jobbers, who have in the past in other directions made distinct headway toward the adoption of standard goods.

Without the hearty co-operation with this society of the master plumbers, the jobbers and the manufacturers, any standardization is bound to be long delayed. In its place various cities will adopt their own regulations, which are sure to be different from one another, and will increase rather than diminish the existing confusion.

The regulations of cities through their departments of health or buildings will have the greatest bearing upon the effectiveness of any plan just as they have at present, with the maintaining of Extra-Heavy pipe above certain minimum weights. The members of this society can wield a most potent influence in the direction of uniformity of requirements for soil-pipe and fittings.

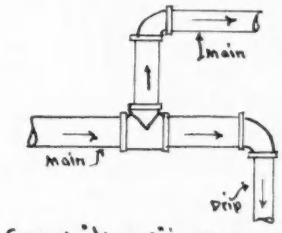
An American professor says: "In London I once overheard a cook correcting the grammar of a housemaid. 'Don't say "ax," you wulgar critter,' corrected the cook; 'say "harsk."'"

The Boss Talks to His New Foreman About Heating

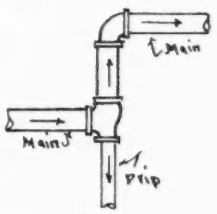
Written by T. Twice

III.

Fig. 13 is a good method of making a "jump up" in your mains, as it allows the water of condensation to flow past the steam opening and you are not so liable to get wet steam as in the case of Fig. 14, where the condensation striking against the tee will create a churning motion or action, and thus wet the steam being carried to the higher



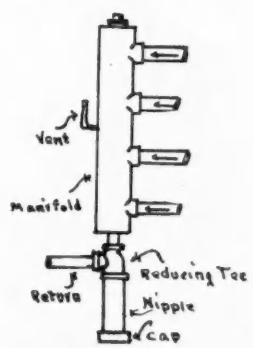
Correct "Jump up" in main
Fig 13.



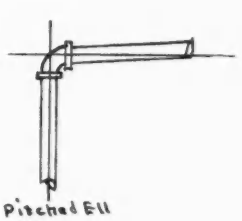
Incorrect "Jump up" in main
Fig.14

main. You must watch all these little points, as it is the little things that make or mar your heating work. You will find it good practice to put "scale-pockets" on return end of your coils, as they make a better place for the sediment to collect than in the interior of your piping system, are not expensive to install, and are easily cleaned. They only add a nipple, cap, and the difference in cost between a tee and an ell and a trifle more labor, but they are worth ten times the cost in making your job an ideal one and that should be your aim on every job, and you will find that when it becomes known that you only do one grade of work, and that grade the best, you will have a class of customers that will stay with you, and make the best kind of advertising for you. If you cannot get a price for a job that will enable you to give you client "value received," John, let some other fellow have the job. A poor heating job that you have installed is a poor recommendation, you will find as you get farther along in the heating game.

Note the location of the air-valve in Fig. 15. You will find this location will give the best results. Do not be



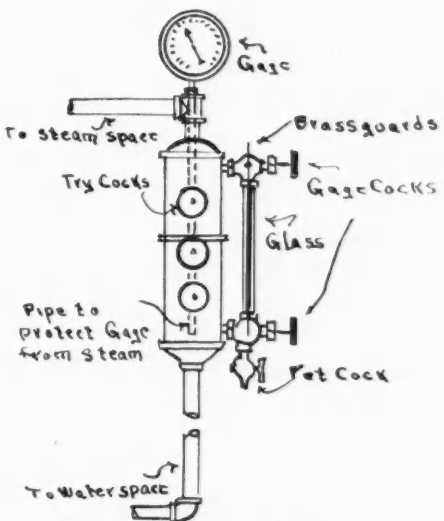
Scale Pocket for Coils
Fig 15.


Pitched Ell
Fig 16
1" to 10'-0" also 1/2" to 1'-0"

afraid to use pitched ells, as shown in Fig. 16, as they are cheaper than trying to cut pitched or crooked threads, and you will only have to cut straight or regular threads, which will not damage the stock in the pipe, as in the case with the pitched threads. Pitched ells are made to pitch 1 in. in 10 ft., and you can also get them to pitch ½ in. in one foot if you wish.

Fig. 17 shows the usual trimmings on a water-column, and also a method sometimes used where it is desired to keep the steam-gage as low as possible. The pipe marked "pipe" in sketch answers the purpose of the siphon commonly used to prevent the steam coming into actual contact with the interior of the gage, as this would cause the gage to register inaccurately. There are a number of "kinks" that we will discuss from time to time, and I will make a note of them as they come to mind, for future reference.

Here is one thing that you don't want to do, John, and that is to garantee that a job will require a certain amount of fuel for the heating season. Let some one else do it if he wants to. Too many different grades of coal;



Water Column Trimmings
Fig.17

too many different grades of attendants; too many different grades of weather; and too many other conditions for you to take a shot at garanteeing the amount of fuel to be used. "Let George do it."

If you have not already started a library, John, "get busy." You will find "Notes on Heating and Ventilation," by Allen, and "Principles of Heating," by Snow, pretty good dope to read up on. They both put a bunch of information to you in such shape that you can easily understand it. I believe you can get both of them from the Book Department of "Domestic Engineering." Only cost you two cents to find out, anyhow.

Here is one DON'T, John, while we are on the advice question, on high-pressure steam-work. NEVER (do you get that?) attempt to do anything with the piping unless you are absolutely sure that the steam is shut off, unless you don't care what might happen, and have your insurance paid up and your estate properly divided so the heirs will not have to go to law about it. High-pressure steam-piping, John, is very similar to the "gun that was not loaded," when the pressure is on, and, take it from me, don't take any chances. I recall a case where some

fitters tried to stop a leak in a flange-union on a high-pressure line carrying 120-lb. pressure, without shutting off the steam, and now one fellow does not use his left arm as freely as he did before, and the other fellow has a different looking face to the one he had before they attempted to stop the leak. I guess you can imagine what happened. Water, "crazy with the heat," is "heap much bad medicine," as the Indian would express it, so bear this in mind.

You will find the following flue sizes about right for average conditions:

Size of Flues or Chimneys.

Sq. Ft. direct	H. P.	size	Sq. Ft. direct	H. P.	size
250	2.5	8x8	1800	18	12x16
300	3	8x8	2000	20	12x16
400	4	8x8	2200	22	16x16
500	5	8x12	2500	25	16x16
600	6	8x12	3000	30	16x16
700	7	8x12	3500	35	16x20
800	8	12x12	4000	40	16x20
900	9	12x12	4500	45	16x20
1000	10	12x12	5000	50	16x20
1200	12	12x12	6000	60	20x20
1400	14	12x16	7000	70	20x20
1600	16	12x16	8000	80	20x20

There are a number of things that may cause a chimney to have a poor draft, and the chief ones to look out for are: The flue may be partially choked up with soot; or the masons may not have been careful about cleaning the inside from mortar; or a brick may have dropped down the flue in such a manner as to reduce the area; or there may be other openings into the flue (these should be stopped up); or the flue may extend so far below the opening for the boiler smoke-pipe as to form an air-pocket, which might have a tendency to cause a down draft in the flue (remedy this by stopping off the space); or in passing a fire-place the boiler-flue may be restricted in area; or, if an old chimney, the mortar may have worked out from between the bricks, which will allow air to enter and act as a check damper; or if the chimney is a new one, the draft may be poor until the chimney dries out; or the smoke-pipe from the boiler may extend so far into the chimney as to cut off the draft; or the chimney may be lower than the higher portion of the roof, which will have a tendency to cause a down draft, and a number of other reasons that you will have to learn by experience. So much for the chimney question.

I forgot to mention to you that in measuring the windows to get the glass exposure, measure the ENTIRE window opening and not the actual glass surface only. Don't forget this or you may have to put some radiation in on a job to make your garantee good, and then you will be getting "experience," and experience is usually costly.

Well, let's call it a day and go home, and see what the neighbors have brought in.

(To be continued.)

NEWS FROM MILWAUKEE.

The school board has awarded contracts for additions to the North and South Division high schools. The North Division plumbing contract was given to S. V. Hanley, on his bid of $2,765. The heating was awarded to the Downey Heating Co. for $5,547, while the Johnson Service Co. will install the heat regulators for $400. The South Division contracts were given to Wm. Esser, plumbing for $1,653; Downey Heating Co., heating for $6,641; Johnson Service Co., heat regulators for $500.

The display of the Grassler & Gezelschap Co., 214 3rd Street, at the Industrial Exposition which is being held in Milwaukee this week, has attracted much attention. The company, besides being in the plumbing business, manufactures and sells artistic lamps and electric fountains.

PACIFIC COAST COMMENTS.

San Francisco.

F. Koch & Son have been awarded the contract for the installation of the plumbing and gas-fitting in the three-story and basement building in course of construction at Third and Minna streets by Carmel Fallon. This contract is valued at $1,753. The steam-heating system will be installed by the John G. Sutten Co., for $730.

The Gilley-Schmid Co. has just been awarded the contract for the installation of the plumbing, gas-fitting and vacuum-cleaning system in a four-story building being erected by the Kronenberg Realty Co., at McAllister and Franklin streets. The steam-heating system will be installed by the Lennig-Rapple Engineering Co. for $3,100.

An additional appropriation has been asked for work in the Girls' High School and if this is passed $375,000 will be available for the construction of the building. Bids have been invited for the various items, the lowest for the plumbing having been $16,000. The lowest bid for the heating and ventilating work was $33,000 and for the vacuum-cleaning system $2,500. No awards have been made and none will be announced until a decision is reached in reference to the increased appropriation.

Willard C. Chamberlin, the Coast representative of the Standard Sanitary Manufacturing Co., with headquarters in the Metropolis Bank building, has returned from a trip to all of the leading cities in Oregon and Washington.

J. E. O'Mara, who for some time has been located at 449 Minna St., in the downtown district, has found it convenient to make a change and has moved a few doors east to 443 Minna St., where the shop is now in operation.

Carl F. Ernst, a plumber living at 639 Hayes St., was held up by masked highwaymen recently but lost no valuables. As soon as he saw the gleaming barrels of the revolvers he began to yell and the men took to their heels without searching him.

Elsewhere on the Coast.

Berkeley, Cal.—President Wheeler, of the University of California, has announced that, owing to the new law in regard to taxation and the resulting shrinking of the available funds, no work on new buildings will be done on the campus in the near future. Agricultural Hall and one or two small buildings upon which work is now being done will be completed, but all plans for other buildings have been set aside for the time being. This will be unwelcome news to plumbers and heating contractors, for it was believed that a great deal of work would be done during the coming year.

Oakland, Cal.—Some of the contracts that were let a couple of weeks ago for heating and ventilating work in school buildings will probably be abrogated on account of technical errors. The contracts let were as follows: Elmhurst school, Robert Dalziell, jr., $5,600; Dewey school, the Charles E. Thomas Co., $5,100; Melrose school, Murray & Co., $5,135. The contract with Robert Dalziell, jr., has already been abrogated and it is likely that new bids will be called for at an early date. The contract was awarded against the protest of Mrs. Annie F. Brown, one of the school directors, and it was known at the time that the bids were irregular. The residents in the annexed districts are bitter in their denunciation of the manner in which the authorities of the city of Oakland are handling the school and sewage questions and declare that the promises made to them before annexation ae not being fulfilled.

Lodi, Cal.—The arrangements and design of the septic-tanks that have been planned to care for the sewage, have met with so much critiçism that Dr. Snow, secretary of the State Board of Health, went there recently to settle the disputes. The residents of Lodi claim that they have an admirable sewage system and do not wish any changes made. The protestants are chiefly parties having property near the sewage farm.

Richmond, Cal.—The Standard Oil Co. is planning work that will cost in the neighborhood of $1,000,000 and which will mean the use of large quantities of pipe. New pipe-lines, stills and tank will be installed and the output of the plant will be greatly increased.

THE JOURNEYMAN AND HIS HELPER

JOIN HANDS FOR BETTER WORK

MODERN WALLED CITIES.

Editor "Domestic Engineering":—A lot of people in biblical times marched around a walled city seven times before the walls fell. By legislative process and by other means not sincere or honorable, walls have been built on national and local scales and likewise citizens tie and bind each other in the race for the almighty dollar. Rogues find moral obligations a convenience to bind others, while by their lack of conscience they profit by the moral obligations they have placed on others through unionism, fraternalism and business association.

Most laws are arranged in a manner not to serve the welfare of the community or the nation unless fastened to them is a device legally to assist some element to create a monopoly, with no hope for immediate remedy after the evil effects on the public welfare are discovered. For instance, take the health laws of any state and also the laws operating under them, and they ultimately reveal a mean spirit permeating the laws intended in the interest of public welfare.

A grafter is the modern term for one who uses a public position, office or influence to get what he is not entitled to, either directly or indirectly.

The doctors arrange, piously but not in a broad-minded manner, laws for the protection of the public health; then craftily as a fox, as their pay for devising laws for the dear old public, they arrange arbitrary and unjust conditions governing admission into the profession and into the practice of medicine, tying and binding and gagging the public, in serving the public. This is graft and hypocrisy combined. And the plumbing craft is so unselfishly devoted to the development of sanitary laws that will prevent the masses from wallowing in the mire by the use of legal devices, instead of a derrick and rope to haul the unclean into the Temple of Hygeia? Their sympathy for the unclean would make a crocodile weep. Great is Diana of Ephesus! cried the image makers. Whoopee! cry the lead-heads.

There is not a system or code governing plumbing in the United States which reflects an interest and purpose beyond reproach. There must always be a reward for the unselfish devotion to public welfare and it is tacked on as plain as a tag on dry goods, "That in all manner must the legal device be arranged to prevent a surplus of master and journeymen plumbers." Plumbers of various cities bumping against the walls, binding each other, and striking at plumbers and firms from other communities. Nearly all rulings are as petty and illegal in all cities as is the ruling in Pittsburgh to the effect that applicants for a journeyman plumber's license must be accompanied by sworn statements, and the presence in each case for identification, of two registered master plumbers of the city of Pittsburgh that they know the applicant to be a practical plumber, and that he has had three years' practical service at the plumbing trade. This is apparently on the surface in the interest of the public, but, practically applied, it builds a wall around any city. The men who will tear such walls down will be the non-union element, commonly called "scabs" but probably more free in spirit and decency than the so-called union element that uses its influence wrongly, and unwittingly shows its entrance into decadence.

There is no end to the list of walled towns and interests divinely appointed to assist suffering humanity, for a "consideration." "Water Hammer."

USING THE TAP-BORER.

Editor "Domestic Engineering":—In using one of the tap-borers that I have to bore into lead pipe, I notice that the pipe seems to flatten out considerably. Will you tell me how this may be avoided?

Cleveland. Beginner.

It may be that the tool is dull or not tapered enough to do the work easily. There are two styles of borers made, one having a much more distinct taper than the other. Always keep the tools sharpened. Now if there seems to be difficulty in starting the borer, after you are certain that you have one with the proper taper and that it is in good condition, it would be a good plan to take a bit and bore into the pipe until you have a small hole, from which with the aid of the borer you can easily make the hole required. This will make a much easier and quicker job and you will find that the pipe will not be dented or crushed.

FINDING THE CAPACITY OF THE RANGE-BOILER.

Editor "Domestic Engineering":—The other day I was out in the country and wished to find out how much the range-boiler held. It had been painted and I forgot the rule as to how to figure it. Please publish so I can clip it and paste in my pocket-book.

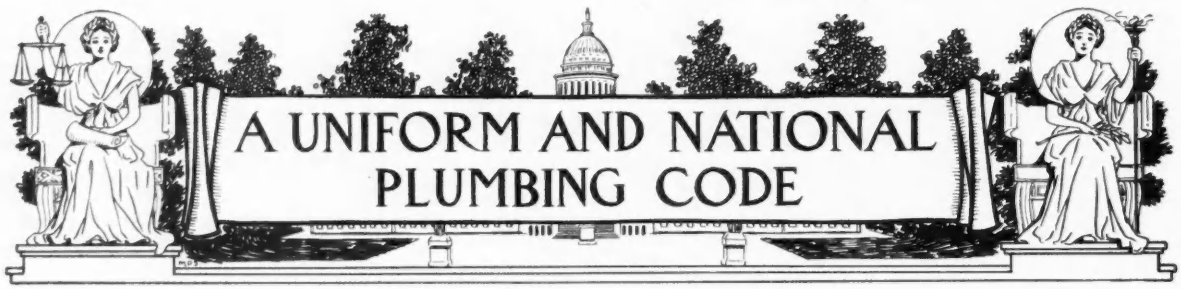
Des Moines. J. J.

This will give it very near, allowing for the slight difference in the curve of the head and bottom. It would tell you where you were at near enough. Multiply the square of the diameter in inches by .7854 and then that result by the height in inches. Divide that result by 231 and you would then have the number of gallons (very nearly) that the range-boiler would hold.

A SERIOUS DISEASE.

Editor "Domestic Engineering":—I note in the Aug. 26th issue, an editorial from a lead-work artist on the "Hardest Points of Joint-Wiping." This man is troubled with mole-skinitis or tickenitis, and the only way for him to recover from this attack is to try some wiping solder on the lead pipe.

Oswego, N. Y. Subscriber.



By Henry D. McCormack, C. E.

XV.

Carriage-Washers.

Under the title of washers will be considered the various forms of space where vehicles are cleaned, and water freely splashed on the floor. The wash-rooms in bottling-establishments and breweries would come naturally under this classification. The principal thing for the code to look out for in the matter of carriage-washers, is to see that the floor connection to the house-sewer or drain is properly made. It is obvious that those in charge will see to it that they have a plentiful supply of water, and that the water-taps are so disposed as to be convenient and available from all points.

Complete drainage, freedom from frost, and an absence of absorbent materials like wood, are the chief considerations in any and all cases. By requiring a flooring of impervious materials, sloping from all points towards the inlet to the drain, two of the considerations, perfect drainage, and non-absorbent materials, will have been fulfilled. Freedom from frost can be had only by keeping the building warm in freezing weather, or by locating the trap at such a depth that it will be below the frost-line, or at some other point where it will be fully protected from the frost. If the washer is designed for such a purpose that it will not be frequently flushed, a trap with an extra-deep seal should be required to tide it over the long periods between use.

The subject of carriage-washers is bound to become a more important one as time goes on. The increased use of the automobile and the growing popularity of the flying-machines are to be factors in bringing this about, while the increased use of gasoline as a fuel for automobile and air-ship motors, is introducing an element of importance, which at the present time is in a fair way to become a troublesome problem. Every garage and every hangar must have a washer. So far the matter is simple. But in each and every one of these buildings greater or less quantities of gasoline and oils are introduced to the sewerage system through the carriage-washers. This at the present time is a problem of no small moment, but with the adoption of the separate system of sewers and the increased growth of the automobile industry, the sewers grow smaller and the quantity of oil and gasoline they must take care of grows larger. The oil decomposes in the sewers, and the gasoline mixes with the air of the sewers, forming explosive mixtures, which are liable to be touched off at any time by a stray spark from a vagrant electric current seeking a passage through the earth back to the point of generation. Besides, the introduction of large quantities of gasoline-gas into the sewers makes it dangerous for those who have work to do on or in them.

Unfortunately, no satisfactory device has yet been put on the market to prevent the entrance of the gasoline to the sewers or neutralize its effects when in there; but before long some steps will have to be taken in that direction. In the meantime, all of our four codes are silent on the subject, merely treating in a more or less superficial way the subject under the title of floor-drains or surface-drains. For instance, San Francisco specifies that "no opening shall be provided in the sewer or drain-pipe of any building for the purpose of drainage, unless the said opening be properly trapped and supplied with water from a suitable fixture. Several surface-drains may be served by one trap conforming to this section, subject to the approval of the board of health.

"All surface-drains shall be of cast-iron, have a suitable strainer-grating and be of such a make as will be satisfactory to the board of health, and it shall not be permissible to use a cement or similar absorbent well-pocket as a surface-drain, unless by special permission of the board of health."

It will be noticed that San Francisco is strong on not telling how work should be done. In the above paragraphs, they call for the work to be "properly trapped" and supplied with water from a "suitable fixture" all "subject to the approval of the board of health"; that all surface drains shall have a "suitable strainer" of "a make satisfactory to the board and health" "and it shall not be permissible unless by special permission of the board of health."

Verily, the San Francisco code is badly in need of a revision.

Under the head of carriage-washers would very properly come stable or stall-drains. Wood should never be permitted for a stable-trough, although wooden slats are permissible for a horse to stand on instead of a cement floor, when the surface beneath the slats is impervious to moisture. At the end of rows of stalls an iron trough is generally run, in sections sloping towards 3-in. outlets, located at certain intervals. Wherever one of those outlets occurs, a cast-iron trap without ventilation is all that is required, the drip keeping the traps sealed, and there being no flushing of fixtures to disturb their seals. Whenever fixtures are located at other points of the building, as they generally are, a main stack would of course be carried to the roof; and whether there are fixtures in the building or not, this provision ought to be required.

Elevator Waste Connections.

In the first place, each city must decide for itself whether it will allow the reckless waste of water incident to running hydraulic elevators direct from the city water-supply. Such a method is wasteful in the extreme of the city water-supply, sometimes scanty at best, and never over-abundant in a large municipality. Added to that is the further fact that most large cities filter their water-supply or are considering filtering it, and it looks like an unnecessary refinement of mechanics to use fresh fil-

tered water to operate an elevator, when by installing a tank the water can be used over and over again. It is probable that in our four cities they do not permit this ruthless waste of water, consequently nothing is said about elevator waste-connections in their codes. It is well for them if they do not, for in a city where the pressure is low or the mains small, those in the vicinity of hydraulic elevators operated direct from the water-supply can tell when the elevator is being operated by the sudden decrease in the flow of water from the fixtures.

When direct-connected hydraulic elevators are permitted, however, the waste-water should be required to discharge into equalizing tanks, from which the water can flow to the street-sewer without pressure and without filling the house-sewer to such an extent as to cause a partial vacuum in the drainage system. The city of Cleveland covers the subject clearly, as follows:

"All direct-connected hydraulic elevators, lifts or pressure machines, shall be provided with an intermediate tank of sufficient capacity so as to discharge its waste without pressure into any sewer-pipe, drain, soil or waste-pipe. Such tanks shall be trapped and vented as other fixtures, and where there is danger of back pressure from sewer there shall be placed on its outlet side a sewer or back-water valve."

There is only one objection to the foregoing provision. Instead of requiring a "tank of sufficient capacity," the code framers should have found out the right proportions for every case, and stated them in positive terms. In our ideal code, nothing must be left open to the discretion of anybody if it can be stated in plain terms in the code itself, and such words as "sufficient," "proper," "approved" and words of like import must be eliminated from codes.

(To be continued.)

NOTE REGARDING "A UNIFORM AND NATIONAL PLUMBING CODE."

By Henry D. McCormack, C. E.

In the August 19th number of "Domestic Engineering" there is quite a discussion of that very important subject, the size of soil-pipes, pointing out the absurdity of requiring 4-in. branch pipes for the discharge of waste from water-closets having trap passages ranging in size from 1¼ in. to 3 in. diameter, and averaging about 2¼ in.

Within recent years there is a decided movement towards the use of smaller pipes, Washington, D. C., being a conspicuous example of a city which permits 3-in. soil-pipes under certain conditions in residences. The state of Ohio is the latest disciple to join the ranks of sensible sizes for soil-pipes, and in the State Code which went into effect on August 17th, the size of branch connection to water-closets is fixed at 3 in. diameter, while two water-closets can be connected to a main stack of 3-in. soil-pipe, together with six other fixtures. That allows for two bath-rooms to be connected to one vertical stack of 3-in. soil-pipe, which is a very sane and sensible allowance.

The making of 3-in. branch soil-pipes the standard throughout the state, will go a long way towards making this the standard size throughout the United States when the benefits derived are realized, and the convenience with which a closet can be put in with little cutting, where now it is impossible without disfiguring walls or rooms.

It is safe to say that the general adoption of the 3-in standard will increase the amount of plumbing work done, for the smaller size of pipe makes available parts of the house that were out of consideration heretofore.

NEW ENGLAND NOTES.

Massachusetts.

Malden.—Monzo A. West, a local master plumber, has just returned from an extensive foreign tour. Mr. West spent much time among the small villages on the Rhine. He also visited Paris and other of the big cities. Mr. West is an extensive traveler and has been abroad on several previous occasions.

Holyoke.—The Holyoke master plumbers have reached an agreement with the striking journeymen, as a result of which the latter returned to work September 1st, after being idle 15 days. The strike was to secure a change in the apprentice system. Under the old system the masters were allowed one helper for each journeyman employed, but under the new agreement they are allowed but one to each three journeymen, with the proviso that the smaller shops where less than three journeymen are employed are to be allowed one apprentice.

Southbridge.—G. C. Winter has a crew of men at work making repairs and alterations on the heating system in the town hall building.

Uxbridge.—The stock and tools of E. G. Conant, who conducted a plumbing and steamfitting establishment at Mechanics' Square for six years, have been sold at public auction. They were bought in by Charles Anderson, who was in Mr. Conant's employ for several years and who will continue the business at the old stand.

Manchester.—Henry Hoare has let the contract for plumbing for the new residence which he is having erected on Norwood avenue to J. F. Scott. Mr. Scott will also do the heating.

Boston.—Edward C. Kelley, secretary of the state board of examiners of plumbers, has announced the dates and places for the holding of examinations for 1911 and 1912 as follows: Springfield, Sept. 16; Boston, Oct. 7; Fall River, Oct. 21; Boston, Nov. 4; Worcester, Nov. 18; Boston, Dec. 2; Lowell, Dec. 16; Boston, Jan. 6; Pittsfield, Jan. 20; Boston, Feb. 3; Springfield, Feb. 17; Boston, March 2; Fall River, March 16; Boston, April 6; Worcester, April 20; Boston, May 4; Lowell, May 18; Boston, June 1; Pittsfield, June 15; Boston, July 6.

South Framingham.—W. B. Frost has been awarded the contract for installing a steam-heating and ventilating system in the Baptist church, which is being remodeled.

Williamstown.—Extensive alterations are being made on the heating system at Williams College under the supervision of John Hallas of the Hanscom Construction Co., of Boston. Upon the completion of the job here the company has a similar contract at the seminary at Northfield.

New Hampshire.

Derry.—Louis Moss Packer, a prominent member of the plumbing trade, was married on August 28th to Grace A. Wentworth of that city. The wedding was held in the Church of the Transfiguration and was largely attended, both of the young people being very popular. Mr. Packer has been engaged in the plumbing business in Derry since 1901.

Laconia.—The Alton Plumbing Co. is enjoying a busy season. Among the contracts in hand are the hot-water heating of W. W. Durgin's residence and a steam-heating system in the house of George Glidden on Bay road.

Concord.—The contract for the installation of bath-rooms and similar work at the Endicott hotel has been awarded to Lee Bros., who will start the work immediately. The contract calls for 16 bath-rooms, a new hot-water heating system and a thorough remodeling of the present plumbing to the latest sanitary requirements.

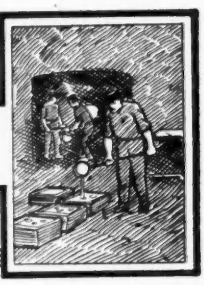
Connecticut.

New Haven.—The Rourke Bros. Co. has the contract for the plumbing, heating and metal work on the society building being erected on State street for the Pulaski Polish Society. The foundations of the building are about completed.

Waterbury.—Work has been started on the changes in the sanitary arrangements at St. Mary's school. M. J. Daly & Sons have the plumbing and heating contract.

Norwich.—The Norwich master plumbers have declared open shop. Some time ago the journeymen made a demand for a change in the wage scale, but the masters refused to consider it on the ground that the agreement under which the men were did not terminate until January 1st. Failing to reach an agreement, the masters decided to declare open shop.

THE METAL MARKET



ACTIVITY IN THE STEEL MARKET.

The reports of the U. S. Steel Corporation show that this company is taking more business for finished steel than at any time this year. This trade is fairly diversified, but structural steel is in especially good demand. Part of the increased business in structural steel is because of the building activity in Chicago where a new ordinance went into effect last week, limiting the height of buildings. In the foundry iron trade there are no new developments, and business is going along slowly. Prices are without change from a week ago and there is a fair degree of activity. Consumers do not seem to care to buy for next year's delivery. Some few contracts have been closed for Southern iron and these have been on a basis of $10.50 Birmingham. In New York what inquiries have developed for next year's business have been at around this year's quotation. There is some little inquiry for foundry iron to be shipped into Canada. This means that consumers there will have to pay a duty of $1.12 more on iron that would be imported from Great Britain. The orders for railway equipment have been held back by the strike news. Quotations are as follows:

No. 2 Southern foundry, Birmingham	$10.50
No. 1 Northern foundry, New York	$15.50 to 15.75
No. 2X Northern foundry, New York	15.00 to 15.25
No. 2 plain, Northern foundry, New York	14.75 to 15.00
No. 2 Northern foundry, Chicago	14.50 to 15.00

OLD IRON.

Prices are lower and the demand is limited. For some classes of material there is practically no inquiry. Quotations are as follows:

No. 1 yard wrought, long	$11.00 to $11.50
No. 1 yard wrought, short	10.00 to 10.50
Heavy-melting steel scrap	10.50 to 11.00
Machinery cast	10.50 to 11.00
Wrought pipes and tubes	10.00 to 10.50
Malleable castings	10.50 to 11.00
Wrought turnings	6.50 to 7.00
Cast borings	6.00 to 6.50
Stove plate	8.50 to 9.00
Light iron	4.25 to 4.75

LEAD.

The market is steady and prices are unchanged at 4.50 cents New York and 4.42½ cents St. Louis.

LITTLE DEMAND FOR COPPER.

The postponement of activity in the line of electrification by some of the eastern roads has reduced the consumption of copper and while the August statistics may show little change, it is probable that the surplus will again accumulate should there be no further demand during the next month. Prices are without change from a week ago, electrolytic selling at 12.50 cents and Lake at 12.75 cents.

PIG TIN.

The steamers "Mesaba" and "Minnetonka," which will arrive before September 10th, will bring about 1,200 tons of tin and this will relieve the scarcity of spot, which has been so apparent in the New York market ever since the beginning of the strike of the freight handlers on the docks of London. Tin is now available at 43 to 43½ cents.

SPELTER.

Prices have again declined and spelter is now quoted at 6.05 cents New York and 5.90 cents St. Louis.

CONTRACTS AWARDED.

Spokane, Wash.—The P. J. Coff Co. has secured the contract for the plumbing installation in the two new buildings now being constructed at the Eastern Washington Hospital for the Insane, at Medical Lake. The contract, which includes all the plumbing in the two buildings, amounts to about $7,000.

Utica, N. Y.—Bannigan & Cooper, 8-10 Devereux St., have the contract for the plumbing work in the new residence to be erected by Prof. W. P. Shepherd.

Peoria, Ill.—O'Connor Bros. have the contract for installing heating and plumbing in the new St. Mark's Church at Washington, Ill. The steam-heating plant is expected to cost $2,700.

Campaign, Ill.—The Reliable Plumbing & Heating Co. has the contract for plumbing and heating the court-house at Benton, Ill. The price is $1,724, and the work is to be completed by Nov. 1st. It also has the plumbing in G. L. Mathews' new house at 406 E. Stoughton St.

Cincinnati, O.—Thomas Carnary, Seventh avenue and Elm street, has the plumbing contract for Geo. W. Harris' building on Seventh avenue and Elm street, and the M. H. Crane Estate the heating contract.

Albany, N. Y.—J. D. Buerger & Son will install the heating system in Mendelsohn & Sons' new factory at Fourth avenue and Church street.

Dallas, Tex.—Kenison Bros. have the contract for installing a new steam-heating plant in the court-house at Denton, Tex., to replace the present worn-out hot-air system. The contract amounts to $2,331.

Columbus, O.—Architects Howard & Marriam have awarded the contract for the heating and ventilating system for the new high school building to be erected at Canton, O., to Fitzpatrick & Hoepfner of Columbus.

Neenah, Wis.—The contract for installing the central heating-plant in the Sherry buildings has been awarded to C. W. Nelson. The central plant will be installed in the basement of the post-office block, and the other buildings supplied from there. The plant will heat four stores, an office building, the post-office and offices in the post-office building. Work is to be commenced at once.

Pasedena, Cal.—E. O. Nay has been awarded the contract valued at $4,150 for the installation of the plumbing systems in two schools being erected at that place.

Oshkosh, Wis.—The contracts for work on the new Orville Beach Memorial Manual Training School have been awarded. For the plumbing, the bids received were Toner Plumbing & Heating Co., $4,774; Mueller Bros., $5,100; Staudenraus & Thayer, $4,800. The heating and ventilation bids were: F. F. McNichol & Co., $7,449; L. W. Duckerschien Heating & Ventilation Co., $7,920; Downey Heating Co., Milwaukee, $7,933; W. S. Patterson, Appleton, $8,097; Carson-Payson Co., Danville, Ill., $8,513.

Not Exactly What He Wanted.

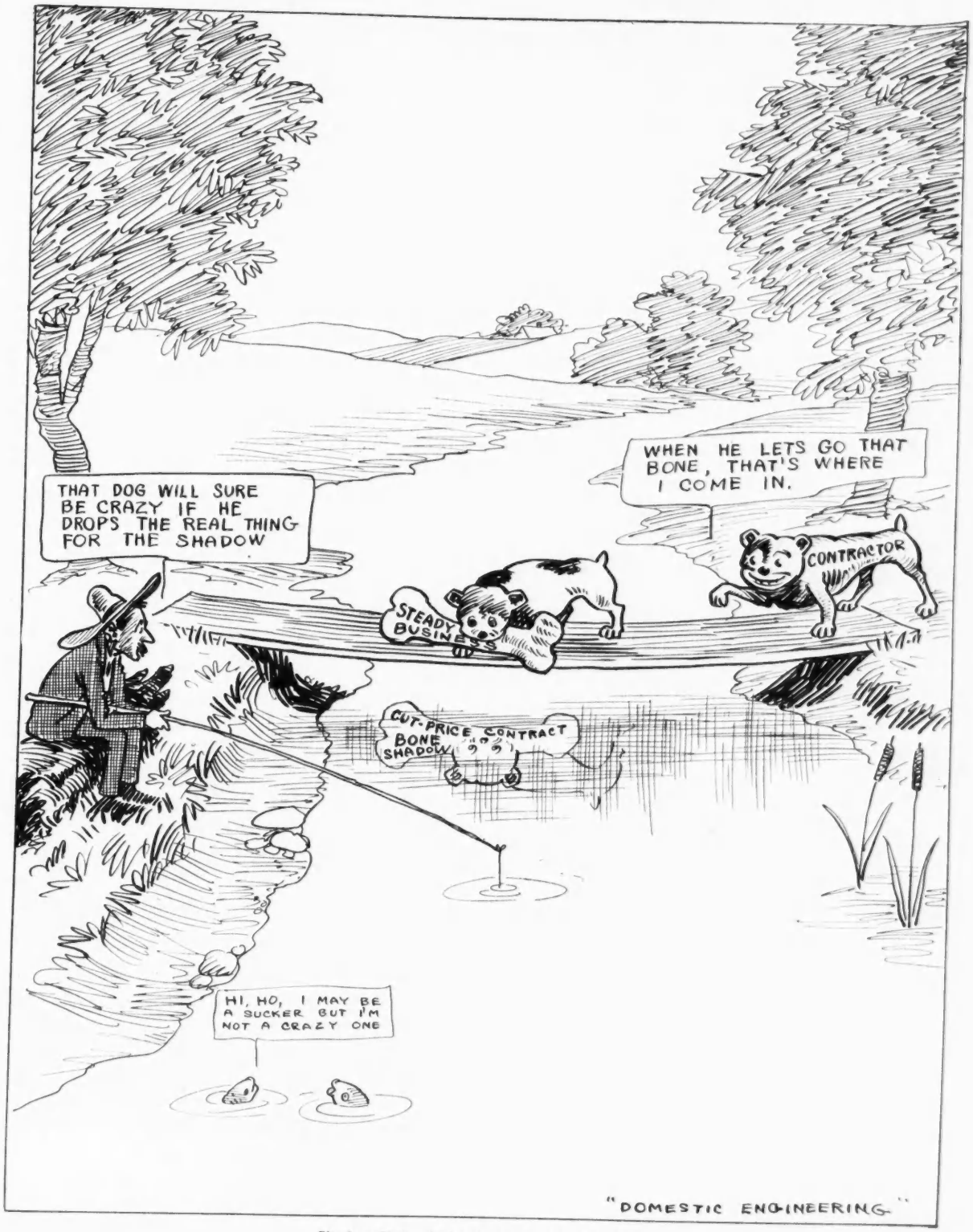
A newly-appointed crier in a county court in Australia, where there are many Chinese, was ordered by the judge to summon a witness to the stand.

"Call for Ah Song," was the command.

He was puzzled for a moment. He glanced shyly at the judge, but found him as grave as an undertaker. Then, turning to the spectators, he blandly simpered:—

"Gentlemen, would any of you favor his worship with a song?"

"Domestic Engineering" Cartoon on "The Shadow of the Bone."—No. L.


THAT DOG WILL SURE BE CRAZY IF HE DROPS THE REAL THING FOR THE SHADOW
WHEN HE LETS GO THAT BONE, THAT'S WHERE I COME IN.
CONTRACTOR
STEADY BUSINESS
CUT-PRICE CONTRACT BONE SHADOW
HI, HO, I MAY BE A SUCKER BUT I'M NOT A CRAZY ONE
"DOMESTIC ENGINEERING"

Shadow-Biting Is Not Good for the Digestion.

If you want to possess a special proof of this or any other of our cartoons, let us have your request at once. We have many applications for our cartoons for framing and want to take good care of all demands made.

AMONG THE WHOLESALERS

PERSONAL MENTION.

Geo. T. Coppins, secretary of the Walworth Mfg. Co., Boston, has recently been attending the semi-centennial reunion of the veterans of the 19th Massachusetts regiment, at Lynnfield, Mass., on the ground from which they started for the South. Mr. Coppins has just retired from the presidency of the veterans' association.

T. H. Langdon, sales-manager for the Day Metallic Co., Detroit, Mich., started on a trip through the East and South on Monday, Aug. 28th. He will stop at the larger centers, and endeavor to show the jobbing trade just how metal bath-tubs differ from Atwood's flying-machine.

D. T. Moriarty, formerly with the Monument Plumbing Supply Co., of St. Louis, Mo., has accepted a position as traveling representative for the Enameled Tank Co., Kalamazoo, Mich. Mr. Moriarty will cover the Central Western states.

THE PACIFIC PORCELAIN WARE CO. TO BUILD ADDITIONS TO ITS PLANT.

The Pacific Porcelain-Ware Co. is preparing to make additions to its plant at Richmond, Cal., and has secured a large tract of land for this purpose. This concern recently took the contract in competition with large eastern firms for furnishing the plumbers' supplies in the porcelain line for the largest hotel ever erected in Portland, Ore., and will shortly commence work on turning out the goods to be used there. The Richmond plant is the only one of its kind west of the Mississippi River, and has been a success from the opening day. Orders are on hand for more goods than can be furnished and the enlargement of the plant is an imperative matter.

WILL SOON DECIDE ON TYPE OF BUILDING FOR THE MARK-LALLY CO.

Construction work has not yet been commenced on the Mark-Lally Building on Second street, San Francisco, Cal., that is to be the home of this concern, but it is expected that this will be begun at an early date. The exact type of structure has not yet been agreed upon, some of the members of the company desiring a steel frame building and others a cheaper type. A fireproof building of the former type would cost about $140,000, but a class-C building that would answer all requirements could be put up for less than $100,000. Mr. Lally left for the East recently to confer with his associates and this matter will be definitely settled at an early date. As soon as the type of building is decided upon contracts will be let and the work of erecting the structure will be rushed at the greatest possible speed. The firm is now in great need of larger and better located quarters and expected to be able to move from First and Folsom streets before the rainy season set in, but this will now be out of the question.

NO REDUCTION IN PRICE OF MERCHANT PIPE.

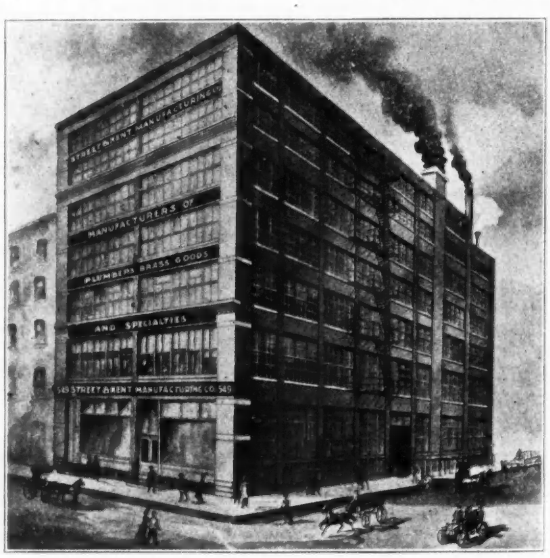
No new price has been named on merchant pipe by the National Tube Co., Pittsburgh, Pa., and there is no probability of any such action prior to October 1st, when present garantee expires. There have been rumors that an "official" change would be made before this, says "The American Metal Market," these rumors being based upon the fact that there was shading in the market, rather than upon any definite pronouncement or even hint from the company.

The pipe market reveals that there is shading by a number of mills, in the case of attractive business reaching an extra 2½ per cent which amounts to a trifle less than half a point, or about a dollar a ton, taking the whole range of material covered by the merchant pipe card.

The trade is looking for the National Tube Co. to take the lead in the matter of prices. Possibly it will not this time. The Steel Corporation's policy has changed in the past two months, its work being more of the open competitive sort, and this fact is not fully recognized in all quarters. Besides, the control of the National Tube Co. is more from the general regard in which it is held by the other producers than by reason of its tonnage. Chairman Gary's testimony before the Stanley committee showed that while in 1901 the corporation made nearly 60 per cent of all the welded pipe made in the country, in 1910 the proportion was only 38.2 per cent, which of course, shows very little semblance of control.

TRADE LITERATURE RECEIVED THIS WEEK.

The Street & Kent Mfg. Co., 549 Fulton St., Chicago, has just issued a mammoth loose-leaf catalog containing 211 pages, illustrating and describing the company's plumbers' brass work and sanitary specialties. It is known as catalog No. 3, and in its make-up the manufacturers have adopted the plan of classifying each line of goods. The illustration shows the factory, salesroom and



The Street & Kent Mfg. Co.'s Factory in Chicago.

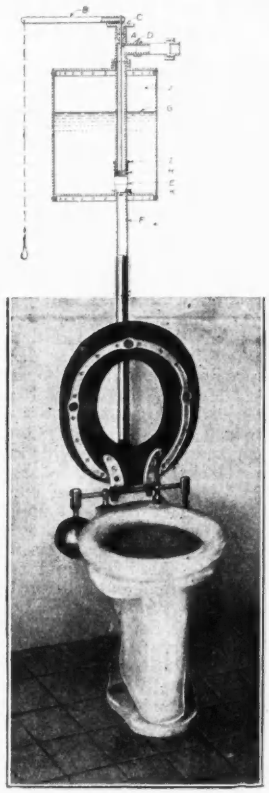
general offices of the company. The new catalog is not only remarkable for its size, but for its clear presentation of the company's products by description and illustration. Buyers are assisted by a double index, one of the general lines and the other for the specific lines. In addition, the catalog will prove of assistance to any plumber who de-

sires to be conversant with the goods he may be called upon to supply at any moment. It can be secured upon request to the company. Mention "Domestic Engineering" when writing.

The O'Brien Vacuum Co., Butte, Mont., is presenting to the trade the O'Brien positive air valve for vacuum and steam-heating systems in a neat pamphlet which illustrates and describes the different types of the valve and their respective uses. This new air-valve is the result of 44 years of constant study of heating needs, and offers several interesting features for consideration. Those desirous of obtaining complete description and illustrations of the O'Brien air-valve can secure them by writing for the booklet. In writing mention "Domestic Engineering."

A NOISELESS COMPRESSION-TANK.

Thos. Kelly & Bros., Chicago, have recently introduced to the trade a noiseless compression flush-tank. Its construction is such that it is air-tight, and requires no ball-cock nor overflow-pipe. The operation depends upon the moving of the plunger-rod, which is shown at A. On the plunger-rod is placed a piece of packing. It is raised by the pulling of the chain on the lever B, working straight up and down on the lever-support shown at C. The water enters at D during the filling of the tank, and after this is completed, the plunger being reseated, the washer E seats itself at K. The spring shown at H banks itself at I and insures a positive-up-and-down motion. When the water reaches D, the tank is again ready for use. J indicates the air-space remaining. F is the flush-pipe.



A Noiseless Compression Tank.

Operating as it does by water-pressure, it is claimed that the flushing action is as powerful with one gallon of water as with three gallons when used with ordinary apparatus. The illustration shows the type designed for urinal and closet combined. It can be adapted to any of the Kelly combinations for flats, apartments, residences and office buildings. The Kelly concern made extensive experiments with the new apparatus before placing it on the market, one of them having been in service with perfect action in the office of Thos. Kelly & Bros. for over two years. The manufacturers maintain that this is the first time that the chain-pull has been successfully used with a compression air-tight tank. The upper half of the illustration shows a sectional view of the cylindrical compression-tank. The tank can also be concealed and be operated by means of a push-button. The Kelly compression-tank will fill the requirements of water-companies that do not permit the siphon-leg in the tank, owing to the liability of overflow by leaky ball-cocks. The main idea of the manufacturers was to evolve a simple mechanism which would prevent the waste of water. Owing to the rapid growth of population in many cities, many water-companies are insisting on economical water-using apparatus. This is especially true of smaller progressive towns and cities. It is estimated that Chicago's waste of water costs the city $3,000,000 a year. This, if based on water-rates prevailing at Pensacola, Fla., and Fond-du-Lac, Wis., would mean the enormous sum of $21,000,000. Many small towns consume 12 barrels of water per capita where one barrel should be ample. Plumbers residing in towns and cities where water-supply is proving to be a problem, will doubtless see advantageous marketing possibilities by use of the Kelly compression-tanks, a complete illustrated description of which can be obtained upon application. When writing, mention "Domestic Engineering."

"NOTES ON HEATING AND VENTILATION."

Domestic Engineering Co. has just issued the third edtion of "Notes on Heating and Ventilation," by Prof. John R. Allen, of the University of Michigan. Prof. Allen is considered one of the leading authorities on heating in the world today. For the last three months, prior to his departure for Constantinople, he has given a great deal of attention to the careful revision of this well-known work. In its previous editions it has served as a text-book for many colleges and universities, and has been received by the heating trade as an invaluable aid in practical work.

The new edition differs in many ways from the previous editions. It has been printed in standard size; the illustrations have been brought up-to-date, and new material for their description has been inserted in the text wherever necessary. The work has received the trade's approval because of the fundamental treatment of heating subjects and the accuracy of the tables contained therein. "Notes on Heating and Ventilation" in its new form contains 233 pages, 5½x8½, bound in dark-green cloth, title in gold, and will be sent postpaid for $2.50 to any address. No heating library will be complete unless it contains the new edition. It may be secured from the Book Department of "Domestic Engineering," 443 So. Dearborn St.

OBITUARY.

Thomas F. Foley.

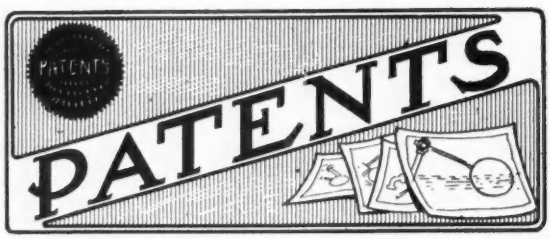
Thomas F. Foley, who had been associated with M. E. Clifford & Co., plumbers, of Concord, N. H., for the past five years, died at a Concord hospital following an operation, on August 26th. He was 36 years of age and a native of Nashua, where he was in the plumbing business previous to his removal to Concord. A widow survives.

Clarence M. Briggs.

Clarence M. Briggs, for 40 years in the plumbing business in Athol, Mass., died at his home in that town August 27th, after a long illness, at the age of 60 years. Death was due to Bright's disease. He was a native of Athol and had always lived there.

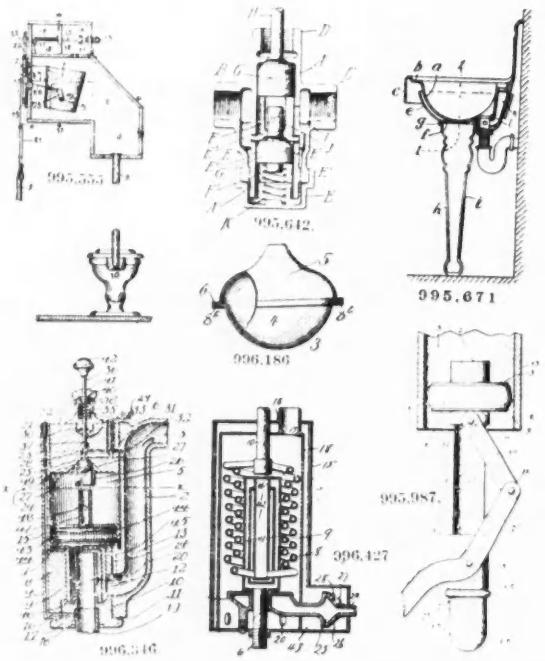
H. T. Allen.

H. T. Allen, a prominent member of the Los Angeles, Cal., Master Plumbers' Association, was killed almost instantly Tuesday evening, August 22d, when the motorcycle he was riding collided with a heavy truck. His sudden death came as a shock to his many friends. Mr. Allen, who was only 28 years of age, leaves a wife and two children.



Plumbing Department.

995,555. Closet-Flushing Mechanism. Thomas H. Parker, Dallas, Tex. In a device of the character described, the combination with a pivotally mounted vessel, of a casing within which the same is mounted, having a reservoir in its lower portion provided with a discharge outlet, means by which the vessel is deflected slightly from the vertical in its normal position, means adapted to counterbalance the weight of the vessel and its contents until the vessel is almost full, a pipe adapted to discharge into said vessel, a valve adapted to close the outlet of said pipe, means by which said valve is caused to open or close when rotated through a certain angle, a latch tending to hold said lever fixed when the valve is open, means by which said latch is released when the vessel discharges, and means acting upon the lever causing it to close the valve when the latch is released.



995,642. Valve. Earl G. Watrous, Chicago, Ill. The combination of the valve-casing A having the pipe-connections B, C and D and containing the chamber F having the by-pass J and an outlet as its upper end, and provided with the port I communicating with the cold-water supply, the supplemental casing A′ screwed into the lower end of the main casing A and abutting against the lower end of the cylindrical wall of the chamber F, said supplemental casing A′ containing the valve chamber F′ and having an outlet into the chamber F at its upper end, and provided with the ports E′ communicating with the hot-water supply, and the valves G and G′ located in the respective chambers F and F′ and co-operating with each other and with the admission and outlet ports of said chambers in the manner described, the screw cap E closing the lower end of the main casing A, and the spring K interposed between said cap and the valve G′, substantially as set forth.

995,671. Enameled-Iron Lavatory. Alfred S. Hamlin, Mamaroneck, N. Y., assignor to McCrum-Howell Co., New York, N. Y., a corporation of Connecticut. In a pedestal lavatory, the combination, with a basin having a center-waste-pipe, and an overflow channel projecting from the rear side, of a cradle fitted about the under side of the basin and formed with an opening to clear the said channel, and provided under the center of the basin with a seat to support a pedestal, with a hole through the center for the passage of the waste-pipe, and a separate hollow pedestal fitted to said seat and slotted at the rear for the passage of said waste-pipe and a trap.

995,987. Testing-Plug for Soil-Pipes. Paul J. Rich, Chicago, Ill. A testing device comprising a pipe, an elbow provided on one end of said pipe, a flexible hose connected to said elbow, a radial flange provided at the other end of said pipe, an annular expansion ring seated on said flange, and means for forcing said expansion ring against the seat thereof comprising a flange abutting said ring and slidably mounted on said pipe, a stationary sleeve surrounding said pipe and supported by said elbow, a lever pivoted to said sleeve and a link connection between said lever and slidable flange, substantially as described.

996,186. Flush-Valve. William R. Willetts, Waterbury, Conn., assignor to American Pin Co., Waterbury, Conn., a corporation of Connecticut. A hollow flush valve having its seat portion of rubber, and an upper metallic stiffening and supporting member united to said rubber seat portion substantially as described.

996,346. Flushing-Valve. Thomas W. Keen, Swissvale, Pa. A flushing-valve comprising a casing having a water outlet at its bottom, a back-pressure chamber, a bore opening into said outlet, and a water outlet passage communicating with said outlet and extending to the top of the casing, a plug secured to the casing and having an inlet pipe projecting through the bore, said plug and the wall of said casing provided with means for establishing communication between said pipe and said chamber at the top of the latter, means carried by the casing at the top thereof for regulating the supply of water to said chamber, a plug arranged within the casing and forming the top wall of said chamber and having channels opening into said chamber and into the water outlet passage near the top of the latter, a shiftable valve for controlling said channels and adapted when shifted in one direction to open the channels, thereby reducing the water pressure in said chamber, and a piston within the casing and having depending means projecting into the bore and surrounding said pipe for opening and closing said outlet and further having upwardly-extending means for closing said valve, said piston actuated on a reduction of pressure in said chamber to open the outlet and to seat said valve and actuated in the opposite direction on an increase of pressure in said chamber to close said outlet.

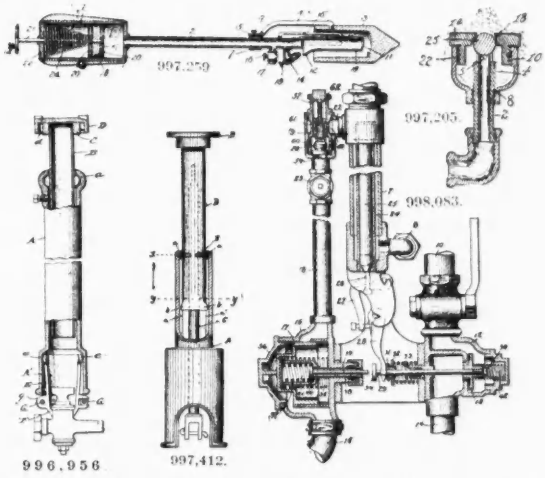
996,427. Water-Heater. Frederick Reissner and Henry J. Warren, Stamford, Conn., assignors to Stamford Gas Stove Co., Stamford, Conn. In a water-heater, the combination with an outer casing having an air-inlet in its top, of an inner jacket arranged within the casing and having air-inlets in its low portion communicating with the casing and an outlet from its upper portion to the outer air, a water-heating coil arranged entirely within the casing, supply and discharge pipes for the water connected respectively to the lower and upper ends of said coil, a gas-burner arranged entirely within the jacket below the coil and a gas supply-pipe for the burner.

997,259. Self-Heating Soldering Implement. Hiram E. Barber, Stamford, Nebr. In a self-heating soldering implement, the combination of a fuel tank, a tubular stem projecting from the fuel tank, an air-mixing tube projecting axially from the end of the tubular stem, the rear end of the air-mixing tube being flared laterally so as to open rearwardly, a lateral arm projecting from the stem and having the end thereof extended inwardly, said end having a jet opening adapted to discharge into the air-mixing tube, a hollow soldering copper receiving the air-mixing tube, and a fuel supply pipe leading from the tubular stem to the lateral arm and passing between the air-mixing tube and the soldering copper.

997,205. Drinking-Fountain. Timothy C. Murphy, Dubuque, Ia. In a device of the character described, a supply-pipe, a cup secured around the upper end of the supply-pipe, a mouth-piece provided with an opening, and a ball rigidly fixed between the end of the supply-pipe and the mouth-piece within the opening.

996,956. Stop-Cock Box. E. L. Walcott, Quincy, Ill. In a stop-cock box, the combination with the body having the enlarged chamber at the lower end, of the clamp having the upwardly extending wall substantially circular in cross-section and fitting entirely within the chamber and inwardly extending clamping jaws at the lower end, said clamp forming a continuation of the body of the box, and means whereby the jaws may be closed to clamp the body of the stop-cock.

997,412. Stop-Cock Box. Thomas G. Paradine, Erie, Pa. The combination in a stop-cock box of a lower tubular section, having an annular groove around the upper end



of the tubular cavity in said lower section, a metallic spring ring in said annular groove, and an upper section of tubing inserted telescopically within said lower section so that the same will be embraced and automatically clamped by the spring ring in said annular groove, substantially as and for the purpose set forth.

998,083. Instantaneous Water-Heater. Reynolds C. Frampton, Swissvale, Pa. In an instantaneous water-heater, a burner, a normally closed fuel-valve, thermostatic controlling means for closing the valve when the temperature of the water rises above a predetermined point, and a water-actuated valve for opening the fuel-valve and comprising a valve casing having inlet and outlet ports, a piston for controlling the ports, a stuffing-box, a spring for holding the piston in position to close one of the ports; a closed casing carried by the piston and proided with a tube extending through the stuffing-box, an auxiliary spring in the casing, and a rod held in forward position by the auxiliary spring extending through the tube and adapted to operate the fuel-valve.

997,309. Sanitary Trap. John W. McAuliffe, New York, N. Y., assignor to Joseph A. Maynard, Boston, Mass. In a sanitary trap, the combination of a dome-shaped cover a having the top a' and the flange a^2 and forming the upper body portion, a lower body portion b having the bottom b', the inward cylindrical extension b^2 with the lip b^3 formed integral with the bottom b' an inlet pipe b^4 and a two-part outlet pipe c consisting of a lower tube c' having the internal screw threaded flange c^2 and an upper tube c^3 having the external screw-threaded end c^4, the flange c^5 and the annular lip c^6, as shown and described.

997,449. Hinge. William A. Henn and M. D. Helfrich, Evansville, Ind. In a hinge, the combination with hinge members pivotally connected together, one of which has an eccentric hub, of a friction ring encircling said hub and provided with a stem, and a coil spring encircling the stem and frictionally holding the ring aginst the said hub.

997,844. Automatic Valve-Operating Device for Tanks. Charles M. Moore, Philadelphia, Pa., assignor to Walls, Owen & Stambach Co., Philadelphia, Pa., a corporation of Pennsylvania. The combination with a container having an outlet-pipe and a float-valve placed to control the flow of liquid thereto; an upwardly extending rod connected to said valve and provided with an abutment at its upper end; a bracket having a spindle and provided with two stops of which one is nearer a vertical line drawn through said spindle than the other; a lever having a slotted arm for the reception of the rod and also provided with a weighted arm extending upwardly be-

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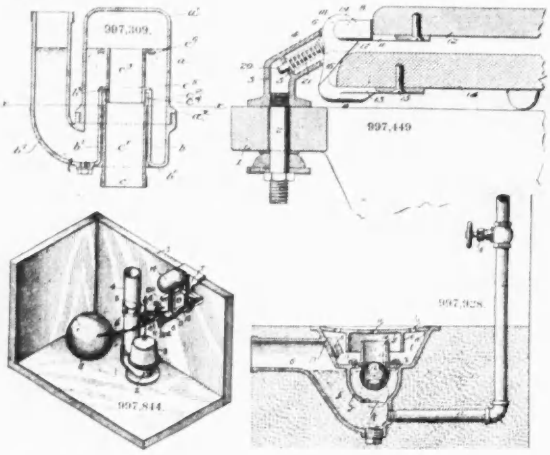
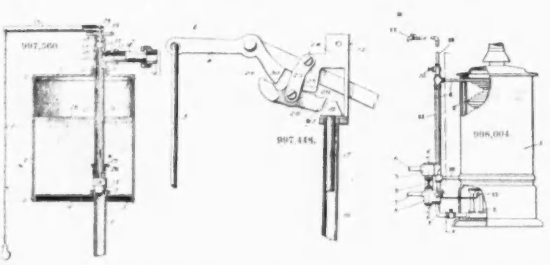
tween the two stops on the bracket; a float-rod also mounted on the spindle of the bracket and provided with a transverse member having two pins each capable of engaging the slotted arm of the lever; and a float fixed to said rod.



997,928. Cellar-Drain and Backwater-Trap. Francis A. McLoughlin, Peoria, Ill. A device of the class described comprising a sink portion, a trap basin integral therewith and having inlet communications therewith, a removable gasket surrounding said inlet, a flanged tubular member superimposed upon said gasket, extending up into the sink and affixed to the bottom thereof, a cover for the sink having a series of openings disposed centrally thereof and a series around the outside thereof, an annular flange depending from the cover between said two series of openings and encircling said tubular member, a discharge-pipe integral with both the trap basin and the sink, and having inlet communications with each, and removable means for stopping said inlets.



997,560. Flush-Tank. John Kelly, Chicago, Ill. In combination, a tank of the character described provided with a water-supply inlet in its upper end and a discharge-outlet in its lower end having a flush-pipe extending from it, a valve-seat leading to said pipe, a dip-pipe depending from said inlet. A T-head on the upper end of the tank at said inlet having its stem adapted for connection with a water-supply pipe, said head having a socket in its upper end, a head supported in said socket, a valve-rod extending through said heads and dip-pipe, and a lever carrying a pull-chain on one end, engaging at its opposite end with the upper end of said rod and having its fulcrum between said ends on the edge of said socket-supported head, and a valve on the lower end of the rod closing against said seat and opening against the lower end of the dip-pipe to close it, for the purpose set forth.

997,448. Seat-Operated Automatic Flushing-Valve for Water-Closets. William A. Henn, Evansville, Ind. In a seat-operated flushing-valve, the combination with a movable seat, and a flushing-valve, of a pivoted member for operating the flushing-valve, an actuating member operated by the seat, a bracket having a lug or abutment, a hanger pivoted to the bracket and adapted to rest normally against the lug or abutment, and a trip pivoted to said hanger and normally held in such position that it is adapted to be swung aside, with the hanger, on the depression of the seat and to be engaged by the actuating member on the rising of the seat and thereby thrown into engagement with the valve-operating member to cause the latter to open the flushing-valve.

998,004. Water-Heater. Herbert S. Humphrey, Kalamazoo, Mich. The combination with a water-heater, of a gas-burner therefor; a gas-valve arranged to control said burner; a water-inlet for said heater; an automatic water-inlet valve arranged to open said gas-valve; a water discharge for said heater; a thermostat connected to said gas-valve; a return or circulation connection for said water discharge and water inlets; an automatic circulation valve comprising a circulation valve member, said circulation valve member having a downwardly-projecting stem, an inlet valve member slidably mounted on the stem of said circulation valve member, and a spring interposed between said valve members, said circulation valve member being adapted to close before said inlet valve member is opened and vice versa.

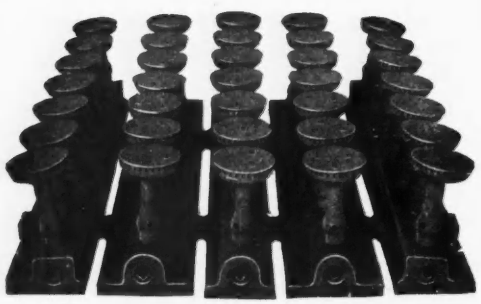
NEW BUSINESS VENTURES.

International Falls, Minn.—Boylan & Co., have opened a plumbing and heating establishment and have already several jobs on hand, including work for the Duluth Brewing Co. and the Keyes block. The firm is composed of Mike Boylan and Robert Fluck. Mr. Fluck will have charge of the new shop and Mr. Boylan will remain in Virginia, Minn., where the firm has had an establishment for five years.

Waterloo, Ia.—The Frush Plumbing Co. has been incorporated with a capital of $25,000 to do plumbing, heating and tin-work, and a general plumbers' supply business. The incorporators are: Geo. H. Frush, jr., Wm. J. Cosgrove, G. D. Bertram and Stephen Mullany, who are also the first officers of the new corporation.

Evanston, Ill.—The Northwestern Heating and Plumbing Co. has been incorporated by Chas. S. Wallace, Geo. A. Kearney and E. Major, to do a general plumbing business. The capital stock is reported as $5,000.

Atlanta, Ga.—The Wingate Plumbing Co. has been organized with a capital of $1,000.



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